

Journal of Advanced Research in Health Sciences

Sağlık Bilimlerinde İleri Araştırmalar Dergisi

Submitted: 26.06.2025
Revision Requested: 29.08.2025
Last Revision Received: 05.09.2025
Accepted: 15.09.2025
Published Online: 21.10.2025

Review Article

Open Access

Oral And Dental Health in Adolescents

Ergenlerde Ağız ve Diş Sağlığı



İpek Hazal Çerçiler ¹  , Arzu Pınar Erdem ² 

¹ İstanbul University, Institute of Health Sciences, PhD Program in Pediatric Dentistry, İstanbul-Türkiye

² İstanbul University, Faculty of Dentistry, Department of Pediatric Dentistry, İstanbul-Türkiye

Abstract

Adolescence is a critical developmental period characterised by rapid physical, psychological, and behavioural changes that significantly influence oral and dental health. Conditions originating in childhood, such as dental caries and anxiety, may persist or worsen. Risk factors frequently encountered during this stage include poor dietary habits, nicotine use, early-onset alcohol consumption, substance abuse, eating disorders, oral piercings, and increased orthodontic needs.

Excessive consumption of sugary and acidic foods contributes to caries development and erosion, while the rising prevalence of obesity in adolescents—strongly linked with caries—highlights the need for integrated health strategies. Eating disorders such as anorexia nervosa and bulimia nervosa, which are more common during this period, can cause severe oral complications including enamel erosion, mucosal trauma, and salivary dysfunction. Risky behaviours such as substance use may result in periodontal disease, dental trauma, or tooth loss. Moreover, increased participation in contact sports increases the incidence of orofacial injuries, which can be mitigated through preventive measures such as custom-fitted mouthguard.

This review analyzes the bidirectional relationship between adolescent obesity, eating disorders, and dental caries prevalence during adolescence, a critical period in which behavioural patterns with long-term implications for oral health are established. Moreover, the review addresses other major oral health challenges unique to this age group, emphasising evidence-based preventive protocols in paediatric dentistry. In conclusion, the impact of these conditions on general health and quality of life is evaluated,

Öz

Adölesan dönem, bireylerin fiziksel, psikolojik ve sosyal açıdan hızlı bir gelişim gösterdiği kritik bir evredir. Bu dönemde, çocukluk çağına başlayan ağız ve diş sağlığı sorunları devam edebilmekte ve daha karmaşık hale gelebilmektedir. Ergenlik dönemi, yüksek çürük prevalansı, travmatik dental yaralanma riski, dental fobi, yetersiz beslenme alışkanlıkları, alkol ve madde kullanımı, yeme bozuklukları, oral piercing kullanımı, nikotin kullanımı ve ortodontik tedavi ihtiyacı gibi ağız sağlığını olumsuz etkileyebilecek birçok risk faktörünü barındırmaktadır.

Yetersiz beslenme alışkanlıkları, özellikle şekerli ve asidik gıdaların aşırı tüketimi, çürük insidansında artışa neden olabilmektedir. Ayrıca, adölesan dönemde obezite prevalansının artması ve obezite ile diş çürüğü arasındaki güçlü korelasyon, bu yaş grubunda ağız sağlığının korunmasının önemini artırmaktadır. Ergenlik dönemi, bireylerin yetişkinlikteki beslenme alışkanlıkları ve genel sağlık durumlarının şekillenmesinde belirleyici rol oynamaktadır. Anoreksiya nervoza ve bulimia nervoza yeme bozuklukları da bu dönemde sıkça görülmekte ve ağız-diş sağlığı üzerinde ciddi olumsuz etkilere yol açabilmektedir. Alkol ve madde kullanımı ise periodontal hastalıklar, dental erozyon ve diş kayıpları gibi ciddi oral sağlık sorunlarına zemin hazırlayabilmektedir. Kontakt sporlara ilginin artması ve erken yaşta spora başlama eğilimi, orofasiyal yaralanma riskini artırmaktadır. Diş hekimliği, ağız koruyucuları gibi koruyucu yaklaşımlarla bu yaralanmaların önlenmesinde önemli rol oynamaktadır.

Bu derleme, ağız sağlığı üzerinde uzun vadeli etkileri olabilecek davranış kalıplarının olduğu adölesan dönemde, bireylerin ağız-diş sağlığı üzerine etkili olabilecek faktörleri ele alarak, ergen obezitesi/yeme bozuklukları ile çürük prevalansı arasındaki çift



“ Citation: Çerçiler İH, Erdem AP. Oral and dental health in adolescents. Journal of Advanced Research in Health Sciences 2025;8(3):256-264. <https://doi.org/10.26650/JARHS2025-1727869>

© This work is licensed under Creative Commons Attribution-NonCommercial 4.0 International License. 

© 2025. Çerçiler İH, Erdem AP.

✉ Corresponding author: İpek Hazal Çerçiler ipekhazal.cerciler@ogr.iu.edu.tr



underscoring the importance of timely, evidence-based preventive and therapeutic approaches.

Keywords Adolescents • dental health education • feeding and eating disorders • paediatric obesity • sports injuries

INTRODUCTION

Adolescence is defined as a period marked by rapid biological and physical development, along with sexual and psychosocial maturation, during which individuals gain independence and become socially productive (1).

According to the World Health Organisation (WHO), adolescence is the phase of life between 10 and 19 years, marked by significant physical, psychological, and social changes. Many changes characterise the transition from childhood to adulthood. During this period, the person's independence from their parents increases and behavioural changes related to aspects such as eating, health, and lifestyle are observed. Since the foundation of oral health practices is established at a young age, the development of these independent behaviours can create patterns that can continue throughout life (2, 3).

Dental anxiety or fear and anxiety associated with any dental treatment can affect a person's oral health habits and desire to receive dental treatment. Although it can occur at any age, it is more common in children and adolescents, and it has been strongly associated with avoidance or delay of dental treatment, leading to neglected oral health and reinforcing its status as a significant public health problem (4, 5).

Therefore, the aim of this review is to analyse the bidirectional relationship between adolescent obesity, eating disorders, and dental caries prevalence and to further examine other major oral health challenges unique to adolescence, with particular emphasis on evidence-based preventive protocols in paediatric dentistry.

ORAL AND DENTAL HEALTH IN ADOLESCENTS

Oral health is largely neglected among adolescents. Oral diseases can have a profound impact on overall health and can lead to problems such as pain, school absenteeism, and even heart disease. In addition to lifelong concerns such as career management and sports injury prevention, adolescents have specific oral health needs. During adolescence, a variety of factors can affect oral health, including high rates of dental caries, increased risk of traumatic injury, dental anxiety, poor eating habits, early-onset alcohol consumption, drug use, eating disorders, oral piercings, increased sugar intake, initiation of nicotine use, orthodontic treatment, and other

yönlü ilişkiyi analiz etmekte ve pedodontide kanıta dayalı koruyucu protokollere odaklanmaktadır. Aynı zamanda, ergenlerin karşılaştığı oral sağlık sorunları, bu sorunların genel sağlık ve yaşam kalitesi üzerindeki etkilerini incelemeyi amaçlamaktadır.

Anahtar Kelimeler Adölesan • diş sağlığı eğitimi • beslenme ve yeme bozuklukları • pediatrik obezite • spor yaralanmaları

social and psychological issues. Therefore, a comprehensive approach is needed to motivate adolescents to address their oral health, as such habits are often formed during this stage of life (5, 6).

Adolescent Caries Patterns and Periodontal Health in Adolescents

Even in developed countries, adolescent caries patterns remain a major health problem, affecting 60%–90% of school-aged children and the vast majority of adults. Severe caries can reduce children's quality of life, leading to increased hospitalisations, higher medical costs, missed school days, and ultimately reduced learning abilities. It can also cause pain, discomfort, disfigurement, acute and chronic infections, and eating and sleeping disorders. The impact of caries on oral and general health is related to the child's age, the timing of the appearance of carious lesions, the depth of the lesions, and their location on the teeth. Young permanent first molars are particularly susceptible to caries, with occlusal fissures being the most common sites affected up to 12 years of age. The risk decreases as the time since eruption increases, highlighting the first 4-5 years after eruption as the most critical period for the development of new lesions. (7, 8).

Gingivitis is almost universal among children and adolescents, with varying degrees of severity. The European Academy of Paediatric Dentistry (EAPD) emphasises that this near-universal prevalence underscores the importance of initiating preventive measures and tailored oral hygiene education early in life. It is predominantly plaque-induced, and hormonal fluctuations during puberty, as well as systemic conditions such as diabetes, may exacerbate gingival inflammation; however, the condition is generally reversible with proper oral hygiene. Beyond its biological aspects, gingivitis also has psychosocial consequences. A Brazilian cohort study with 743 adolescents demonstrated that gingivitis adversely affects oral health-related quality of life, particularly emotional well-being, independent of other oral and socioeconomic factors (9, 10).

According to the American Academy of Paediatric Dentistry guidelines, "Destructive forms of periodontitis are relatively uncommon in children and adolescents, but may occur in association with systemic conditions or as aggressive periodontitis. Aggressive forms usually emerge around



puberty and are characterised by rapid attachment and bone loss, most frequently affecting the first molars and incisors. In addition to genetic and systemic conditions, obesity has been identified as a potential risk factor, as it contributes to a hyperinflammatory state in adolescents. Although the overall prevalence is low (0.1%–0.5%), higher rates have been observed in certain populations, particularly among adolescents of African descent. Systemic disorders such as Down syndrome, Papillon-Lefèvre syndrome, and neutrophil function defects have been associated with severe early-onset periodontitis, leading to significant tissue destruction. Necrotising periodontal diseases, although uncommon in developed countries, may affect 2%–5% of children and adolescents in developing regions and are characterised by pain, fever, gingival necrosis, and ulceration” (11).

Recent evidence supports the obesity–periodontitis relationship. Obesity is a common eating disorder among adolescents. Recent data have established links between obesity, periodontitis, and various systemic diseases. Increasing rates of obesity in children and adolescents, combined with increased adipose tissue, contribute to a systemic inflammatory environment. Biological factors linking obesity and periodontitis are believed to include the hyperinflammatory state commonly associated with obesity, abnormal lipid metabolism, and insulin resistance. These systemic problems may contribute to the further destruction of periodontal tissues. Therefore, it is important to recognise that altered systemic response parameters in obese and overweight children and adolescents may manifest in gingival tissues earlier in life and increase the long-term risk for periodontal tissue damage (12, 13).

Promoting Oral Hygiene in Adolescents

Adolescents often prioritise their independence, which leads them to minimise the importance of oral care among their priorities. It is essential to encourage young individuals to maintain good dental health. To this end, it is recommended that they brush their teeth at least twice a day with fluoride toothpaste and floss daily. Since adolescents attach great importance to their appearance, it is essential to educate them about the possible consequences of poor oral hygiene, such as adolescent caries patterns, periodontal disease, and other dental problems. It is also useful to demonstrate effective brushing and flossing techniques during dental check-ups. Families can increase adolescents’ knowledge through education, support, and guidance. The development of individual awareness is essential to foster a healthy society in the future, and this awareness can be nurtured in childhood and strengthened throughout adolescence (5, 14).

As parents, it is essential to set a strong example for adolescents regarding oral hygiene. During this formative period, young individuals are greatly influenced by the actions and words of their parents, teachers, and healthcare providers and often reflect their behaviours. Furthermore, adolescents often consume significantly more high-sugar foods and beverages (7, 15).

Therefore, it is advisable to limit access to high-carries snacks and offer healthier alternatives, such as various fruits and vegetables, to meet snack needs. In addition, it is essential to avoid fizzy drinks, fruit juices, and sugary treats (7, 16).

Mattos et al. assessed the evidence on the link between the oral health of family members or caregivers and the prevalence of dental caries in children. Their systematic review included 15 studies that included 5,704 families/caregivers and 5,467 children/adolescents. The findings revealed a significant association between the oral health of mothers or caregivers and the prevalence of caries in children/adolescents, reported in 93.7% of the studies. The findings indicate that the oral health of family members or caregivers is associated with the incidence of dental caries in children. Modelling dietary and oral hygiene habits, including high-sugar diets, frequent eating, oral care practices, and genetic factors, influences this association. Additionally, taste genes inherited from biological parents may play a role in children’s consumption of sugary foods (17).

Adolescents should schedule regular dental checkups and have dental scaling done at least twice a year when necessary. Radiographs may be necessary to detect early caries and access timely treatment with restorations rather than delaying care that could result in tooth extraction (5, 18).

It is essential to provide adolescents with access to preventive dental care services. These practices are crucial in preventing adolescent caries patterns and addressing the early stages of early carious lesions. Because many health-related behaviours and attitudes, such as dietary preferences and smoking, are often formed during childhood, it is important to instil appropriate dental hygiene habits at an early age to ensure they continue into adulthood. Therefore, preventive dental care services should be specifically targeted to children between the ages of 6 and 15 and should improve their oral and dental health (7).

Preventive Approaches in Adolescent Dental Care

Pits and fissures are extremely vulnerable to the development of caries. Fissure sealants help in caries control by forming a physical barrier that prevents metabolic exchange between fissure microorganisms and the oral environment. The American Dental Association recommends the use of fissure



sealants for the permanent teeth of children and adolescents at risk for caries. Studies have shown that the percentage of lesions that are free of caries is significantly reduced for up to 5 years after the application of these sealants (5, 19).

Another preventive measure is the use of fluoride varnishes. Studies have shown that regular application for 2 years can reduce the incidence of caries by 38%. According to the AAPD 2023 Guideline on Use of Fluoride, "Fluoride varnish is highly effective in caries prevention and should be applied at 3–6 months intervals in children and adolescents at elevated caries risk. In addition, sealants are recommended as an evidence-based strategy for preventing pit and fissure caries in permanent molars." (20).

Orthodontic Considerations

Most adolescents require orthodontic treatment. Premature loss of primary teeth during the mixed dentition period may lead to space loss and subsequent malocclusion, emphasising the role of interceptive orthodontics in paediatric dentistry. Malocclusion makes effective oral hygiene difficult, leading to early tooth loss and increased masticatory muscle tension. Beyond its clinical implications, malocclusion in adolescents is linked to negative effects on self-perception and quality of life. While no direct association with bullying was found, oral conditions contributed to feelings of embarrassment about appearance, impairing interpersonal relationships and overall well-being (21, 22).

Therefore, an early diagnosis and intervention are essential. The American Dental Association recommends that every child over the age of seven receive an orthodontic examination. Generally, the ideal time to begin orthodontic treatment is between the ages of 10 and 14, which coincides with this critical developmental stage (7, 23).

Bacterial plaque is the primary aetiological factor in the development of adolescent caries patterns. The adverse effects of plaque are also evident during orthodontic treatment. Patients receiving orthodontic care often find it more difficult to effectively remove plaque using standard oral hygiene practices. Cleaning around brackets, where carbohydrates from plaque and saliva tend to accumulate, poses an even greater challenge (24).

In orthodontics, adolescent caries patterns affect between 2% and 96% of patients undergoing orthodontic treatment. The increased risk of caries during such treatment is attributed to several factors, including darkening of lesions, increased volume of dental plaque, and accelerated changes in bacterial flora (25).

The primary recommendation is to brush teeth after each meal to prevent these complications. Thorough brushing with fluoride toothpaste, a soft-bristled toothbrush, and interproximal brushes is essential because food particles can quickly become trapped between the brackets. Teeth and brackets should be meticulously cleaned in the morning and evening with a soft-bristled toothbrush, and dental floss should be incorporated into the daily oral hygiene routine (7, 26).

Nutrition and Eating Disorders

Adolescents exhibit various eating habits characterised by irregular meal patterns and frequent snacking between meals. Eating out and fast food consumption is typical of this age group. Multiple factors, including family, peers, and the media, influence these habits. Eating patterns during adolescence are often characterised by behaviours such as frequent skipping of meals, especially breakfast, constant snacking throughout the day, a tendency towards fast food, initiation of alcohol consumption at an early age, a strong preference for sugary and carbonated beverages, regular consumption of products containing caffeine, picky eating behaviours, excessive caloric intake, inadequate consumption of essential nutrients, and inconsistent adherence to structured dietary regimens (27, 28).

Hardy et al. aimed to investigate the relationships among sugary beverage consumption, oral health effects, and weight status in adolescents. The study included 3,671 adolescents with a mean age of 13 years. The findings showed that consuming more than one serving of sugary drinks per day (including diet soda, sports and energy drinks) was associated with more oral health problems than consuming less than one serving per day. The results demonstrate that the daily consumption of sugary drinks is common among adolescents and is linked to higher rates of oral health problems. (29).

Nutritional Strategies for Oral Health in Adolescents

- Eat various foods to ensure adequate protein, vitamins, minerals, and dietary fibre intake.
- Minimise dietary imbalances by limiting excess fat, saturated fat, cholesterol, sugar, and sodium intake while ensuring adequate protein, vitamins, minerals, and fibre levels.
- Ensure adequate calcium and vitamin D intake to support optimal bone density.
- Maintain a healthy body weight by ensuring adequate energy intake to prevent obesity and eating disorders.
- Develop a physically active lifestyle



- Avoid behaviours such as vomiting after overeating and the excessive use of laxatives and diuretics.
- Aim to avoid fast food options such as hot dogs, hamburgers, pizza, French fries, and processed and smoked foods.

The most common eating disorders observed in adolescents include obesity, anorexia nervosa, and bulimia nervosa. If these eating disorders are not diagnosed and treated early, they can persist into adulthood. Early intervention is extremely important as the effects of eating disorders can negatively affect the physical and psychological health of the individual (29, 30).

Obesity

The World Health Organisation defines obesity as "abnormal or excessive fat accumulation that poses a health risk". In adolescents, obesity is classified according to the WHO BMI-for-age z-scores (5–19 years), where overweight is defined as $>+1SD$ (equivalent to a BMI of 25 kg/m² at 19 years) and obesity as $>+2SD$ (equivalent to a BMI of 30 kg/m² at 19 years). It is a major health problem characterised by increased body fat and is frequently seen in adolescents. Without appropriate rehabilitation programmes, 75–80% of obese adolescents will remain obese until adulthood. Adolescent obesity is often associated with overeating and is classified as exogenous obesity (31, 32).

The first step in the treatment of adolescents diagnosed with obesity is to regulate their eating habits. There is a strong relationship between nutrition and adolescent caries patterns. Adolescent caries patterns not only negatively affect nutrition but also poor eating habits can lead to the development of caries and poor oral health. excessive carbohydrate intake and the excessive consumption of simple sugars are closely related to caries adolescent caries patterns and obesity (33, 34).

Researchers have also established a significant relationship between obesity and periodontitis in adults; Ferraz et al. investigated the impact of obesity on oral hygiene in 180 children aged 6–14 years. The results demonstrated that obese children had significantly higher oral hygiene and gingival bleeding index values compared with their normal-weight peers, demonstrating a poorer oral hygiene status in the obese group. However, the biological mechanisms underlying the relationship between dental and periodontal tissues and obesity have not yet been fully elucidated. Paediatric dentists should prioritise preventive treatment and oral hygiene education for these adolescents and, when necessary, use topical fluoride and casein and phosphate-containing agents for adolescent caries pattern prevention (33, 34).

Adolescent caries patterns and obesity are two major health problems in adolescence and are increasing in prevalence globally. When developing a treatment plan for obese adolescents, paediatric dentists may need to collaborate with a nutritionist and, when appropriate, a child psychiatrist. The nutritionist's management of dietary habits may support the paediatric dentist's adolescent caries pattern prevention efforts. Furthermore, continued communication between the paediatric dentist and the child psychiatrist during the treatment process may help alleviate dental anxiety and contribute to more favourable outcomes during the treatment process (34, 35).

Martins et al. conducted a literature review of articles published since 1995 to examine the relationship between obesity and oral health in children and adolescents in Mexico. The review concluded that there is no conclusive evidence of a direct relationship between poor oral health and high body mass index. However, the findings indicate that Mexican children frequently experience both obesity and dental caries (35).

Anorexia Nervosa

Anorexia nervosa is diagnosed when an individual's body weight falls below 85% of the expected level due to stunted growth or an inability to maintain weight above this threshold. Often referred to as the 'disease of the age,' anorexia nervosa is an eating disorder syndrome that predominantly affects young girls. The aetiology of anorexia nervosa is multifactorial, involving a complex interaction of biological, psychological, and sociocultural factors that contribute to the development of the disorder (36).

Bulimia Nervosa

Episodes of binge eating followed by compensatory behaviours aimed at losing weight, such as self-induced vomiting, excessive exercise, or prolonged fasting, characterise bulimia nervosa. Individuals with bulimia nervosa typically restrict their food intake, but they often lose control and engage in episodes of binge eating following periods of restrictive dieting. Adolescence represents a critical period for the development of this disorder, and risk factors include weight, negative body image, dieting, impulsivity, stressful life events, family conflict, early menarche, family history of eating disorders, and history of childhood sexual abuse. (7, 37).

Psychological and behavioural features, eating disorders are frequently associated with a spectrum of orodental manifestations. Classical findings include enamel erosion, particularly on the palatal and lingual surfaces due to



recurrent vomiting, parotid gland enlargement, and mucosal trauma. Recent systematic reviews have demonstrated additional complications, including alterations in salivary flow and composition, increased susceptibility to caries, and periodontal involvement, underscoring the multifactorial impact of these conditions on oral health. In addition, the use of antidepressants and antipsychotics by patients with eating disorders may reduce salivary flow and potentially contribute to the progression of tooth erosion. (38, 39).

Pallier et al. conducted a study to assess dental and periodontal health in patients with anorexia nervosa and bulimia nervosa. They compared 70 adolescents with eating disorders to a healthy control group, recording dental checkups and oral hygiene behaviours for all participants. The findings revealed that individuals with eating disorders had more frequent dental visits and brushing habits compared with the control group, and the control group had lower plaque index and less bleeding on probing than the eating disorder group. In assessing periodontal parameters, the researchers found that patients with anorexia nervosa had a higher mean plaque index, more bleeding on probing, and more significant clinical attachment loss compared with patients with bulimia nervosa. The study results emphasise the importance of carefully assessing periodontal and dental health in patients with eating disorders and the need for specific oral hygiene recommendations and treatment services specific to the type of eating disorder (37).

Sports-related Injuries

Participation in sports activities can result in various injuries, including orofacial injuries, affecting individuals of all ages. In particular, the incidence of sports-related injuries is extremely high among adolescents. With the increasing interest in contact sports and the encouragement of individuals to participate in these activities, the role of dentistry in preventing dental and orofacial trauma has become increasingly important. Contact sports involve physical interactions between players and prevent the opposing team or individual from winning. Examples include American football, baseball, basketball, rugby, ice hockey, boxing and wrestling. Injuries usually occur because of player-to-player contact or being struck by the ball or other objects. The face is the most vulnerable and least protected area of the body. Common facial injuries include soft tissue lacerations, abrasions, bruises, tooth intrusions or avulsions, and fractures of the tooth roots or crowns. Zygomatic fractures, mandibular and alveolar bone fractures, and various temporomandibular joint injuries are less common but are considered serious. Symptoms associated with these

injuries may include limited mouth opening and deviation, malocclusion, audible sounds from the joint, muscle and joint pain, and inability to keep the mouth closed. In cases of dental trauma, children may experience abnormal primary tooth loss, delayed eruption of permanent teeth, tooth discolouration, painful abscess formation, and tooth loss due to avulsion. Avulsion is considered the most critical dental injury in terms of prognosis, and prompt and appropriate management is essential for treatment success. According to the International Association of Dental Traumatology (IADT) guidelines, permanent teeth should be replanted as soon as possible, ideally within 60 minutes, followed by flexible splinting for approximately 2 weeks. In contrast, primary teeth should not be replanted (40).

Considering the aesthetic, functional, psychological, and economic consequences, as well as the potential risk of life-threatening complications, preventive measures against sports-related injuries should be implemented (40, 41).

Mouth guards play a critical role in protecting athletes from sports-related injuries. Custom-fit mouthguard, in particular, have been shown to reduce orofacial trauma by up to 90%. The American Dental Association recommends the use of mouth guards in 29 different sports. While experts strongly advocate the use of mouthguard for their protective benefits against orofacial injuries, evidence regarding their effectiveness in preventing specific impacts remains variable. Mouth and face guards are highly recommended as one of the most effective strategies to prevent dental injuries. Developing appropriate preventive measures requires a thorough understanding of the specific types of injuries associated with different sports and their underlying causes (41-43).

Substance Use and Oral Health

Tobacco, alcohol, and drug use are prevalent among adolescents, contributing to oral cancers, periodontal inflammation, and other complications. Smoking, in particular, is associated with increased plaque accumulation, gingival inflammation, and delayed wound healing. (42).

Tobacco use—including cigarette smoking, chewing tobacco, and snus—is alarmingly common among adolescents and is strongly linked to the development of oral cancers. Snus is a relatively new and increasingly popular form of smokeless tobacco that contains a small amount of moist tobacco packaged in pre-portioned pouches that are placed in the lip and does not require spitting. Adolescents who use smokeless tobacco are at a higher risk of transitioning to smoking and engaging in other high-risk behaviours, such as driving under the influence of alcohol, early-onset alcohol consumption, and early sexual activity. In addition to smokeless tobacco,



another rapidly growing trend is e-cigarette (vaping) use. A recent review reported that e-cigarette use is associated with increased inflammatory mediators and oxidative stress in the saliva and gingival crevicular fluid, which may contribute to gingival inflammation. E-cigarette use has also been linked to reduced salivary flow, altered saliva composition, and xerostomia, potentially creating a caries-prone oral environment. Moreover, e-cigarettes have been reported to disrupt the ecological balance of the oral microbiota, promoting the colonisation of cariogenic species such as *Streptococcus mutans*, thereby increasing the risk of caries. Nicotine gum, a form of nicotine replacement therapy, provides controlled doses of nicotine to aid smoking cessation. Although it reduces exposure to combustion by-products, prolonged use may cause mucosal irritation, tooth staining, and sustained nicotine dependence. Therefore, its use in adolescents should be limited to supervised cessation programmes (44).

Every day, approximately 2,500 children under the age of 18 try their first cigarette, and more than 400 of these children become regular smokers. According to the findings of a study by Nazaryan et al., 54 adolescents aged 12 to 18 years participated in the research. The experimental group comprised 25 adolescents with a smoking history of 1 to 3 years, whereas the control group consisted of 29 physically healthy adolescents who had never smoked. The findings revealed an increased prevalence of periodontal inflammation in adolescents with nicotine dependence, which was attributed to the direct effects of tobacco smoke on the microcirculation of the gums. The study concluded that smoking is a significant risk factor for periodontal health in adolescents and that varying degrees of periodontal inflammation are seen in adolescents aged 12 to 18 years (45).

The cytotoxic effects of early-onset alcohol consumption are among the primary causes of malignant degeneration of the oral mucosa, placing individuals who consume alcohol at a higher risk of developing cancer. Skrypnikov et al. included 135 hospitalised patients aged 14 to 17 years in their study to evaluate the condition of the periodontal tissues and oral mucosa. Their findings showed an increased trend in precancerous oral lesions, which was related to the patient's age and the duration of alcohol exposure during adolescence (46).

Studies have reported that individuals who use drugs often exhibit poor oral health. Factors contributing to oral disease include dry mouth, substance-induced increased appetite, and poor oral hygiene resulting from the neglect of general personal care. Cocaine use can lead to ischaemic necrosis of the palate, nasal septum, and gums due to its vasoconstrictive

effects. Both cocaine and methamphetamine use can lead to bruxism and dental erosion (47, 48).

Adolescent substance use behaviours vary considerably across cultural and regional contexts. Van Dorp et al. conducted a systematic review examining the differences in substance use between migrant and native-born adolescents in Europe. The findings revealed that early-onset alcohol consumption was significantly lower among migrant adolescents, particularly those with a Muslim background, compared with their native peers. The results for tobacco and drug use were mixed (49).

Motivational, patient-centred approaches are of great importance in mitigating the wide-ranging oral health risks associated with tobacco use, early-onset alcohol consumption, and substance abuse. Prevention programmes should emphasise the aesthetic and health impacts of these factors in ways that resonate with adolescents' values and concerns (42).

Oral Piercing

Adolescents are increasingly choosing to have oral piercings in areas such as the tongue, cheeks, or lip tissues. Even when performed by a licenced professional, oral piercings pose significant risks to both oral and systemic health. Swelling is common after piercings, and healing can be slow, especially after tongue piercings. Oral piercings can also lead to complications such as metal hypersensitivity, accidental choking from loose jewellery, tooth fractures, and gum damage from jewellery rubbing against the gum line (42, 50).

Covello et al. conducted a study to evaluate the risks and complications associated with oral piercings and to examine the complications in patients who received intraoral piercings. They selected a sample of 387 individuals who received intraoral piercings from randomly selected piercing studios in Italy. Oral examinations revealed that the participants had poor oral hygiene and showed signs of widespread gingivitis. The findings of this study indicate that oral piercings pose significant risks to oral health (50).

CONCLUSION

Adolescence is a transition period from childhood to adulthood during which individuals undergo various physical and psychological developments. This period is characterised by increased parental conflict but improved relationships with teachers, doctors, and peers. Adolescents have unique oral health needs that require attention. Regular dental checkups are essential to manage adolescent caries patterns, maintain periodontal health, prevent sports injuries, and



assess the need for orthodontic treatment. Additionally, the potential risks associated with increased sugar consumption, nicotine or substance use, and oral piercing practices must be effectively communicated. Because health-related behaviours established during adolescence often form the foundation of lifelong habits, a personalised approach is needed to address oral health problems.

Beyond biological outcomes, oral health problems in adolescence also carry profound psychosocial consequences, influencing self-esteem, social interactions, and overall quality of life, thereby underscoring the necessity of holistic preventive and therapeutic approaches.



Peer Review Externally peer-reviewed.

Author Contributions Conception/Design of Study- İ.H.Ç.; Data Acquisition- İ.H.Ç.; Data Analysis/Interpretation- İ.H.Ç.; Drafting Manuscript- İ.H.Ç.; Critical Revision of Manuscript- İ.H.Ç.; Final Approval and Accountability- İ.H.Ç., A.P.E.; Technical or Material Support- İ.H.Ç.; Supervision- A.P.E.

Conflict of Interest The authors declare that there is no conflict of interest.

Financial Disclosure The authors declared that this study has received no financial support.

Author Details

İpek Hazal Çerçiler

¹ İstanbul University, Institute of Health Sciences, PhD Program in Pediatric Dentistry, İstanbul-Türkiye

0000-0002-8405-3104 ipekhazal.cerciler@ogr.iu.edu.tr

Arzu Pinar Erdem

² İstanbul University, Faculty of Dentistry, Department of Pediatric Dentistry, İstanbul-Türkiye

0000-0002-3940-4761

REFERENCES

- Sawyer SM, Azzopardi PS, Wickremarathne D, Patton GC. The age of adolescence. *Lancet Child Adolesc Health* 2018;2(3):223-8.
- Frech A. Healthy behavior trajectories between adolescence and young adulthood. *Adv Life Course Res* 2012;17(2):59-68.
- Global Accelerated Action for the Health of Adolescents (AA-HA!): guidance to support country implementation. 2nd ed. Geneva: World Health Organization; 2023. Chapter 1, p.8-9.
- Cianetti S, Lombardo G, Lupatelli E, Pagano S, Abraha I, Montedori A, et al. Dental fear/anxiety among children and adolescents: a systematic review. *Eur J Paediatr Dent* 2017;18(2):121-30.
- Xiang B, Wong HM, Perfecto AP, McGrath CP. The association of socio-economic status, dental anxiety, and behavioral and clinical variables with adolescents' oral health-related quality of life. *Qual Life Res* 2020;29:2455-64.
- Chimbinha ÍGM, Ferreira BNC, Miranda GP, Guedes RS. Oral-health-related quality of life in adolescents: umbrella review. *BMC Public Health* 2023;23(1):1603.
- Silk H, Kwok A. Addressing adolescent oral health: a review. *Pediatr Rev* 2017;38(2):61-8.
- Kazeminia M, Abdi A, Shohaimi S, Jalali R, Vaisi-Raygani A, Salari N, et al. Dental caries in primary and permanent teeth in children's worldwide, 1995 to 2019: a systematic review and meta-analysis. *Head Face Med* 2020;16:1-21.
- Kühnisch J, Ekstrand KR, Pretty I, Twetman S, van Loveren C, Gizani S, et al. Best clinical practice guidance for management of early caries lesions in children and young adults: an EAPD policy document. *Eur Arch Paediatr Dent* 2016;17(1):3-12.
- Ortiz FR, Sfreddo CS, Coradini AGM, Fagundes MLB, Ardenghi TM. Gingivitis influences oral health-related quality of life in adolescents: findings from a cohort study. *Rev Bras Epidemiol* 2020;23:e200051.
- American Academy of Pediatric Dentistry. Classification of periodontal diseases in infants, children, adolescents, and individuals with special health care needs. In: *The Reference Manual of Pediatric Dentistry*. Chicago (IL): American Academy of Pediatric Dentistry; 2023. p.493-507.
- Bimstein E, Huja PE, Ebersole JL. The potential lifespan impact of gingivitis and periodontitis in children. *J Clin Pediatr Dent* 2013;38(2):95-9.
- Ferrillo M, Calafiore D, Lippi L, Petri A, Mastroianni A, Fortunato L et al. Systemic and oral health parameters in eutrophic and overweight/obese adolescents: a cross-sectional study. *J Pers Med* 2023;13(7):1073.
- Saccomanno S, De Luca M, Saran S, Petricca MT, Caramaschi E, Mastrapasqua RF, et al. The importance of promoting oral health in schools: a pilot study. *Eur J Transl Myol* 2023;33(1):11158.
- Zhang Y, Li KY, Lo ECM, Wong MCM. Structural equation model for parental influence on children's oral health practice and status. *BMC Oral Health* 2020;20:1-10.
- Mahboobi Z, Pakdaman A, Yazdani R, Azadbakht L, Montazeri A. Dietary free sugar and dental caries in children: A systematic review on longitudinal studies. *Health Promot Perspect* 2021;11(3):271.
- Mattos MG, Fernandez CA, Masterson D, Maia LC, Neves AA. Is the caregivers' oral health related to dental caries in children or adolescents? A systematic review. *Clin Oral Invest* 2019;23:3843-54.
- Hennig C-L, Schüller IM, Scherbaum R, Buschek R, Scheithauer M, Jacobs C, et al. Frequency of dental X-ray diagnostics in children and adolescents: what is the radiation exposure? *Diagnostics* 2023;13(3):394.
- Wnuk K, Świtalski J, Miazga W, Tatar T, Religioni U, Gujski M. Evaluation of the effectiveness of prophylactic sealing of pits and fissures of permanent teeth with fissure sealants-umbrella review. *BMC Oral Health* 2023;23(1):806.
- American Academy of Pediatric Dentistry. Policy on use of fluoride. In: *The Reference Manual of Pediatric Dentistry*. Chicago (IL): American Academy of Pediatric Dentistry; 2023. p. 352-8.
- Shakti P, Singh A, Purohit BM, Purohit A, Taneja S. Effect of premature loss of primary teeth on prevalence of malocclusion in permanent dentition: a systematic review and meta-analysis. *Int Orthod* 2023;21(4):100816.



- 22 Tristão S, Ammari MM, Tavares MC, Pomarico L, Pintor AVB, Souza IPR. Relationship between malocclusion, bullying, and quality of life in students from low social development area: a cross-sectional study. *Pesqui Bras Odontopediatria Clin Integr* 2023;23:e220051.
- 23 Zhou C, Duan P, He H, Song J, Hu M, Liu Y, et al. Expert consensus on pediatric orthodontic therapies of malocclusions in children. *Int J Oral Sci* 2024;16(1):32.
- 24 Walsh L, Healey D. Prevention and caries risk management in teenage and orthodontic patients. *Aust Dent J* 2019;64 (Suppl 1):S37-45.
- 25 Şimşek N, Yalçın M, Ersöz M, Alan H, Bulut ET. Ortodontik tedavi sonrası oluşabilecek çürüklere multidisipliner yaklaşım. *Cumhuriyet Dent J* 2014;17(2):179-85.
- 26 Guo J, Li L, Guan G, Bennani F, Mei L. Oral health knowledge and practice among orthodontic clients in China and New Zealand. *Canadian Journal of Dental Hygiene* 2020;54(3):124.
- 27 Köseoğlu SZA, Tayfur AÇ. Adolesan Dönemi Beslenme ve Sorunları. *Güncel Pediatri* 2017;15(2):44-57.
- 28 Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F, Brambilla P, Agostoni C. Factors influencing children's eating behaviours. *Nutrients* 2018;10(6):706.
- 29 Hardy LL, Bell J, Bauman A, Mhrshahi S. Association between adolescents' consumption of total and different types of sugar-sweetened beverages with oral health impacts and weight status. *Aust N Z J Public Health* 2018;42(1):22-6.
- 30 Watts AW, Miller J, Larson NI, Eisenberg ME, Story MT, Neumark-Sztainer D. Multicontextual correlates of adolescent sugar-sweetened beverage intake. *Eat Behav* 2018;30:42-8.
- 31 World Health Organization. WHO child growth standards: BMI-for-age (5–19 years). Geneva: World Health Organization; 2007. <https://www.who.int/tools/growth-reference-data-for-5to19-years>.
- 32 Bakhoda MR, Haghighat Lari MM, Khosravi G, Khademi Z, Abbasi F, Milajerdi A, et al. Childhood obesity in relation to risk of dental caries: a cumulative and dose-response systematic review and meta-analysis. *BMC Oral Health* 2024;24(1):966.
- 33 Bhoopathi V, Tripicchio G. Childhood dental caries and obesity: Opportunities for interdisciplinary approaches to prevention. *Obes Sci Pract* 2024;10(1):e740.
- 34 Ferraz EG, Silva LR, Sarmento VA, de Jesus Campos E, de Oliveira TFL, Magalhães JC, et al. Association between childhood obesity and oral hygiene status. *Nutr Hosp* 2014;30(2):253-9.
- 35 Aceves-Martins M, Godina-Flores NL, Gutierrez-Gómez YY, Richards D, López-Cruz L, García-Botello M, et al. Obesity and oral health in Mexican children and adolescents: systematic review and meta-analysis. *Nutr Rev* 2022;80(6):1694-1710.
- 36 Nagy H, Paul T, Jain E, Loh H, Kazmi SH, Dua R, et al. A clinical overview of anorexia nervosa and overcoming treatment resistance. *Avicenna J Med* 2023;13(01):3-14.
- 37 Pallier A, Karimova A, Boillot A, Colon P, Ringuenet D, Bouchard P, et al. Dental and periodontal health in adults with eating disorders: a case-control study. *J Dent* 2019;84:55-9.
- 38 Lo Russo L, Campisi G, Di Fede O, Di Liberto C, Panzarella V, Lo Muzio L. Oral manifestations of eating disorders: a critical review. *Oral Dis* 2008;14(6):479-84.
- 39 Valeriani L, Frigerio F, Picicchi C, Piana G, Montevicchi M, Donini LM, et al. Oro-dental manifestations of eating disorders: a systematic review. *J Eat Disord* 2024;12(1):87.
- 40 Fouad AF, Abbott PV, Tsilingaridis G, Cohenca N, Lauridsen E, Bourguignon C, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 2. Avulsion of permanent teeth. *Dent Traumatol* 2020;36(4):331-42.
- 41 İlarıslan YD, Dursun E. Sporda Travmatik Dental Yaralanmalar. *Spor Hekimligi Dergisi* 2016;51(1):26-32.
- 42 Juul A, Kreiborg S, Main KM. Growth and pubertal development. In: Koch G, Poulsen S, editors. *Pediatric Dentistry: A Clinical Approach*. 2nd ed. Chichester (UK): Wiley-Blackwell; 2009. p.29-47
- 43 ADA Council on Access, Prevention and Interprofessional Relations; ADA Council on Scientific Affairs. Using mouthguards to reduce the incidence and severity of sports-related oral injuries. *J Am Dent Assoc* 2006;137(12):1712-20.
- 44 Gajendra S, McIntosh S, Ghosh S. Effects of tobacco product use on oral health and the role of oral healthcare providers in cessation: A narrative review. *Tob Induc Dis* 2023;21:12.
- 45 Nazaryan R, Kryvenko L, Zakut Y, Karnaukh O, Gargin V. Application of estimated oral health indices in adolescents with tobacco addiction. *Pol Merkuri Lekarski* 2020;48(287):327-30.
- 46 Skrypnikov AN, Sheshukova OV, Kazakov OA, Trufanova VP, Polishchuk TV, Tkachenko IM. Oral status in adolescents with alcohol addiction. *Wiad Lek* 2019;72(5 cz 2):970-1.
- 47 Mukherjee A, Dye BA, Clague J, Belin TR, Shetty V. Methamphetamine use and oral health-related quality of life. *Qual Life Res* 2018;27(12):3179-90.
- 48 da Silva Fonseca L, Mello ALR, Chisini LA, Collares K. Hard drugs use and tooth wear: a scoping review. *Clin Oral Investig* 2024;28(6):348.
- 49 van Dorp M, Boon A, Spijkerman R, Los L. Substance use prevalence rates among migrant and native adolescents in Europe: A systematic review. *Drug Alcohol Rev* 2021;40(2):325-39.
- 50 Covello F, Salerno C, Giovannini V, Corridore D, Ottolenghi L, Voza I. Piercing and oral health: A study on the knowledge of risks and complications. *Int J Environ Res Public Health* 2020;17(2):613.

