

The Impact of Oral Health on Athletic Performance

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Introduction

Oral health plays a significant role in quality of life and general health, and these effects are particularly noticeable in athletes who may neglect it due to their focus on physical fitness and athletic performance. Although athletes generally enjoy excellent physical health, their oral health is often overlooked, leading to health problems that directly affect their athletic performance (Ashley et al., 2015; Needleman et al., 2015). Research indicates that athletes, whether in developed or developing countries, suffer from increasing oral health problems due to several factors. One of the most prominent of these factors is poor nutrition, as many athletes rely on sports drinks and carbohydrate-rich gels, which increase the risk of tooth decay. Additionally, intense physical activity leads to dry mouth, which reduces saliva flow and weakens the mouth's ability to fight bacteria and prevent the formation of decay-causing acids (Needleman et al., 2015; Schulze & Busse, 2024).

Negative health habits significantly contribute to the deterioration of oral health in athletes. For example, the lack of awareness about using mouthguards during workouts and matches increases the risk of tooth loss and oral injuries. Furthermore, the constant training and competition schedules may cause athletes to neglect oral health, leading to problems such as cavities, wear, and oral injuries. Over time, these issues become more severe, causing persistent discomfort and impacting appearance, mental, and social health, which in turn negatively affects athletic performance (Ranalli, 2005; Tripodi et al., 2021).

Studies show that the prevalence of tooth decay among athletes ranges from 15% to 75%, while the prevalence of tooth wear ranges from 36% to 85%. Additionally, studies have shown that about 15% of athletes suffer from oral health issues that affect their daily lives, and 5% to 18% report a negative impact of their oral health on their athletic performance. According to a systematic review conducted in 2016, 33% to 66% of athletes were negatively affected after experiencing oral health problems, and 28% to 40% reported that their oral health impacted their quality of life (Ashley et al., 2015; Needleman et al., 2013).

Eating disorders are another factor affecting oral health in athletes, as body weight, composition, and aesthetic factors are crucial in some sports, increasing the risk of these disorders. Studies have shown that elite athletes are more prone to eating disorders than non-athletes, especially in sports like boxing, equestrian, gymnastics, and long-distance running. It is essential for sports dentists to be aware of the signs of tooth wear associated with eating disorders (Needleman et al., 2015; Schulze & Busse, 2024).

Furthermore, dry mouth resulting from exercise can amplify the impact of carbohydrates on decay and acidic drinks on wear, as it reduces saliva flow, weakening the natural protective properties of the mouth. Saliva plays a vital role in fighting bacteria and remineralizing teeth, helping protect the mouth from decay (Ranalli, 2005; Tripodi et al., 2021).

Health behaviors, beliefs, and knowledge of basic oral health principles are crucial factors in maintaining oral health in athletes. However, some studies indicate that awareness of oral diseases' risks among athletes is still low. For example, fewer than half of athletes attend regular oral health assessments. Moreover, traditional dental care models tend to focus more on treatment than prevention, making it difficult for athletes to receive necessary preventive advice (Needleman et al., 2014; Schulze & Busse, 2024).

Oral health in athletes faces several challenges, including individual health habits, environmental factors, and the influence of coaches and peers. It is essential to address these challenges comprehensively to raise awareness and implement effective preventive practices (Needleman et al., 2013; Tripodi et al., 2021).

Therefore, oral health should be an integral part of an athlete's health routine. If neglected, it may lead to health problems that directly affect athletic performance and quality of life. It is crucial for athletes, coaches, and dentists to collaborate to raise awareness and promote preventive practices to maintain long-term oral health (Ashley et al., 2015; Needleman et al., 2015).



Figure1. Occlusion of the athlete (closure of upper and lower jaw (Dursun et al., 2015)



Figure2. Mouth-guard precision fits to the athlete's mouth (Dursun et al., 2015)

Factors Affecting Oral Health in Athletes

Oral health in athletes is influenced by several factors, the most prominent of which is xerostomia (dry mouth) caused by intensive physical exercise. Reduced salivary flow compromises the mouth's ability to combat bacteria, increasing the risk of dental caries and periodontal disease (Tripodi et al., 2021; Schulze & Busse, 2024). Additionally, frequent consumption of sports drinks and carbohydrate-rich snacks contributes to enamel erosion and raises the incidence of tooth decay (Needleman et al., 2015; Ranalli, 2005). Oral injuries are also common, especially in contact sports. Although these injuries can be prevented through the use of mouthguards, many athletes neglect this protective measure (Needleman et al., 2014; Ashley et al., 2015).

Moreover eating disorders significantly impact oral health in certain athletes, particularly those involved in sports that emphasize specific body weight or appearance—such as gymnastics, boxing, and long-distance running. Some athletes resort to self-induced vomiting as a means of weight control, exposing their teeth repeatedly to gastric acids. These acids gradually erode tooth enamel, increasing sensitivity and susceptibility to caries and severe erosion. Furthermore, eating disorders like anorexia nervosa can lead to nutritional deficiencies, which negatively affect gingival health and the supporting bone structures of the teeth (Tripodi et al., 2021; Needleman et al., 2015). Another critical factor is the lack of awareness and preventive care. Many athletes do not attend regular dental checkups and often fail to follow proper oral hygiene practices, which heightens the risk of developing long-term oral health problems (Ashley et al., 2015; Needleman et al., 2015).



The Impact of Oral Health on Athletic Performance

Oral health can have both direct and indirect effects on athletic performance. Pain resulting from dental caries or periodontal disease may lead to reduced concentration and decreased physical and psychological capacity. Additionally, chronic oral infections can negatively affect general health, potentially increasing the risk of injuries or delaying recovery (Ashley et al., 2015; Needleman et al., 2015). A study by Needleman et al. (2013), conducted during the London 2012 Olympic Games, reported that 18% of athletes indicated that oral health problems had impacted their training or performance. Some also mentioned effects on sleep, nutrition, and overall quality of life (Needleman et al., 2013). Furthermore, chronic oral inflammation may elevate systemic inflammatory cytokine levels, which can impair physical capacity and delay muscle recovery. Bacterial infections originating in the oral cavity may spread to other parts of the body, increasing the risk of joint or cardiac complications—particularly in cases of untreated severe periodontitis (Ashley et al., 2015; Needleman et al., 2015).

From a psychological standpoint, oral discomfort is another factor influencing an athlete's performance, especially in sports that rely heavily on self-confidence and social interaction, such as gymnastics, equestrianism, or football. Athletes suffering from halitosis or aesthetic dental issues may experience embarrassment or reduced self-esteem during interactions with the public, media, or teammates (Needleman et al., 2015; Schulze & Busse, 2024). A study by Tripodi et al. (2021) found that athletes with chronic oral inflammation were more prone to fatigue, reduced performance, and were less able to sustain continuous physical effort. The study also demonstrated a direct association between poor oral health and increased absenteeism from training or competition due to pain or treatment (Tripodi et al., 2021). In summary, oral health is not limited to the prevention of caries or periodontal disease—it also plays a critical role in physical, psychological, and social performance. Therefore, maintaining good oral health should be considered as important as physical fitness and proper nutrition (Ashley et al., 2015; Needleman et al., 2015).



Figure4. Methods of affecting oral health in athletes (Needleman et al., 2014).

Prevention and Management Strategies

To protect oral health in athletes, a comprehensive approach that combines prevention and early treatment is necessary, taking into account the differences between various types of sports such as football, basketball, weightlifting, equestrian sports, karate, and running. Oral risks vary depending on the sport; for example, football and basketball players face an increased risk of oral injuries, while runners and weightlifters experience dry mouth and tooth erosion due to the consumption of acidic sports drinks (Ranalli, 2005).

1. Daily Oral Care

- Brushing teeth twice daily with fluoride toothpaste helps reduce the risk of cavities and acid erosion (Needleman et al., 2015).
- Using dental floss removes plaque and helps prevent gingival inflammation.
- Rinsing with mouthwash containing fluoride or antibacterial agents is especially useful for athletes who suffer from dry mouth caused by intense exercise (Schulze & Busse, 2024).

2. Hydration and Reducing Sugar Intake

- Drinking water regularly during exercise maintains hydration and stimulates saliva flow.
- Limiting consumption of acidic sports drinks and sugary foods is essential, as these are strongly linked to acid erosion and caries (Needleman et al., 2015).
- Using a straw while drinking sports drinks is recommended to minimize the contact of acids with tooth surfaces (Tripodi et al., 2021).

3. Prevention of Dental and Jaw Injuries

- Wearing mouthguards during training and competitions significantly reduces the risk of dental trauma, with studies showing a reduction of injuries by up to 80% (Ranalli, 2005).

4. Addressing Eating Disorders

- Eating disorders such as anorexia nervosa or induced vomiting can seriously damage oral health. Providing psychological and nutritional support, along with appropriate medical care, is crucial (Needleman et al., 2015).

5. Regular Checkups and Early Intervention

- Regular dental checkups every 3 to 6 months are recommended, especially for athletes engaged in high-risk sports, to ensure early diagnosis and intervention (Tripodi et al., 2021).

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