

# Oral Health and Physical Activity: What is the Relationship?

**M Castaldi<sup>1\*</sup> and GM Nardi<sup>2</sup>**

<sup>1</sup>RDH DHA, ATASIO Active Member, Italy

<sup>2</sup>RDH DHA, Associate Professor Department of Oral and Maxillofacial Sciences, Sapienza University of Rome, Italy

**\*Corresponding author:** Castaldi Matteo RDH DHA, ATASIO Active Member, Italy

## ARTICLE INFO

**Received:** 📅 February 09, 2023

**Published:** 📅 February 17, 2023

**Citation:** M Castaldi and GM Nardi. Oral Health and Physical Activity: What is the Relationship?. A Narrative Review and Recent Updates. Biomed J Sci & Tech Res 48(4)-2023. BJSTR. MS.ID.007697.

## Introduction

Oral health is an important element of overall health, well-being, and quality of life. The nexus between sport and oral health has largely been investigated through studies focused on the risk of trauma, dental caries, dental erosion, and periodontal inflammation [1]. Poor oral health can reduce quality of life and induce a systemic inflammatory response [2,3]. Thus, poor oral health could affect athletic performance [4]. However, the relationship between oral health and performance is not well understood.

## Oral Health in Athletes

One of the earliest surveys of elite athlete health was conducted at the Barcelona Olympics in 1992 (Soler et al., 1994). They reported significant proportions of athletes with caries and in need of restorative care. Subsequently, many researches have reported on more than 840 elite and professional athletes in three large epidemiological studies at the London 2012 summer Olympic Games, UK Professional Football and pre-Rio 2016 Olympic games [4,5]. The results were very consistent across these three studies. Oral diseases were common. Dental caries (at a level requiring intervention) were present in around 49% of athletes and erosive tooth wear in 42% athletes. The researchers found gingivitis in 77% and periodontitis

in 22% of athletes respectively. The findings were generally worse than a similar age cohort from the national UK oral health survey, particularly for dental caries [6,7]. A systematic review also confirmed that oral diseases were common, although variability of methods within the included studies produced wide ranging differences in estimates [8]. Other studies have reported similar findings [8]. In summary, research on elite and professional athletes consistently reports high levels of dental caries, dental erosion and periodontal diseases. Numerous studies report a relationship between strenuous physical activity and problems referred to the oral cavity.

One of these systematic reviews [9] describes that dental caries, periodontal disease, dental erosion and pericoronitis (infections around wisdom teeth)/impacted third molars were widely represented in the oral cavity of athletes. The range of proportion of athletes affected by these conditions were dental caries 15–75%, moderate-to-severe periodontitis up to 15%, dental erosion 36–85% and pericoronitis/impacted third molars 5–39%. Dental trauma was reported by 14–57% of athletes in at-risk sports. Disease incidence was generally not clearly differentiated by socioeconomic status; however, poor oral health appears to affect athletes both from developing and developed countries. The available evidence suggests that poor oral health is common in elite or professional athletes and

the oral health of elite athletes is like non-athlete disadvantaged populations. [9]

## Oral Health and Performance

Several studies have investigated whether oral health has measurable impacts on sport performance. Realistically, this is a difficult aspect to measure. Whilst dental and oro-facial trauma or severe infection can take an athlete out of training or competition (time loss injury) other health impacts (including from oral health) are likely to be of less magnitude and therefore challenging to measure. Although smaller in magnitude, these impacts could be important to training and performance and could be considered like the potential effect of overuse injuries i.e., an athlete may continue to train and compete but at lower intensity or efficiency. For this reason, sports medicine research has focussed on developing self-reported tools of which the best validated is the Oslo Sports Trauma Research Tool (OSTRC) [10]. When employing such tools, an interesting pattern emerges. Typically, 20-30% of athletes reported a negative impact of their oral health on training or performance. More specific questions reveal: 35% athletes reported difficulties eating or drinking, 17% difficulties smiling, laughing, or showing teeth without embarrassment and 15% difficulties relaxing.

Therefore, elite and professional athletes commonly report a negative impact of their oral health on their training and performance and in addition, more specific effects on wellbeing. Identifying the pathways by which oral health affects performance is ongoing research. Such pathways could include physical effects such as raised systemic inflammation resulting from oral disease as well as psychosocial effects through pain, self-reported bleeding, and appearance. No direct evidence has yet been published that identifies an impact of oral inflammation on sport performance. However, in non-athlete populations, periodontitis has been found to be a risk factor for low cardiorespiratory fitness in sedentary non-smoking men [11]. These findings were confirmed in a cross-sectional analysis of two large German cohorts, including 1,639 and 2,439 subjects, respectively [12].

Probing Pocket Depth (PPD) was consistently associated with VO<sub>2</sub>peak as well as exercise duration. Interestingly, this association remained significant after restricting the analysis to cardiorespiratory healthy participants only. Similarly, periodontitis was associated with poorer physical activity test results in male police officers following adjustment for age, BMI, and regular exercise [13]. There was a dose response with poorer outcomes associated with severity of periodontitis. In addition to raised systemic inflammation another pathway for impact on performance is through psychosocial impacts. Much research has published statistically significant associations between several the factors described earlier with negative performance impacts [4,5,6,12,13]. These factors are also commonly associated with impacts on oral health related quality of life and therefore highly plausible that they might affect performance. In relation to the other self-reported impacts mentioned earlier regarding common effects of poor oral health in athletes on eating

and drinking, sleep and relaxation, there are additional possibilities that there could be negative effects on nutrition and sleep hygiene both of which are key to supporting athlete performance, recovery, and wellbeing [14].

## Conclusion

Oral health is closely linked to systemic health. For this reason, physical activity plays a crucial role in both general well-being and sports performance in professional athletes. Performance impacts from oral health are hard to research because of their relatively lower magnitude although important within high performance sport. Nevertheless, negative performance impacts are common. The evidence is clearest for psychosocial effects arising from poor oral health. In non-athlete populations, periodontal inflammation is associated with reduced measures of fitness and may point to a further effect of the well-established phenomenon of raised systemic inflammation caused by periodontitis and other oral infections [5,6].

## References

1. Needleman I, Ashley P, Petrie A, Fortune F, Turner W, et al. (2013) Oral health and impact on performance of athletes participating in the London 2012 Olympic Games: a cross-sectional study. *British journal of sports medicine* 47(16): 1054-1058.
2. Locker D (1988) Measuring oral health: a conceptual framework. *Community Dent Health* 5(1): 5-13.
3. Cullinan MP, Seymour GJ (2013) Periodontal disease and systemic illness: will the evidence ever be enough? *Periodontol* 2000 62(1): 271-86.
4. Needleman I, Ashley P, Fine P, Haddad F, Loosemore M, et al. (2014) Consensus statement: Oral health and elite sport performance. *British dental journal* 217(10): 587-590.
5. Needleman I, Ashley P, Meehan L, Petrie A, Weiler R, et al. (2016) Poor oral health including active caries in 187 UK professional male football players: clinical dental examination performed by dentists. *British journal of sports medicine* 50(1): 41-44.
6. Needleman I, Ashley P, Weiler R, McNally S (2016) Oral health screening should be routine in professional football: a call to action for sports and exercise medicine (SEM) clinicians. *British journal of sports medicine* 50(21): 1295-1296.
7. White D A, Tsakos G, Pitts N B, Fuller E, Douglas G V, et al. (2012) Adult Dental Health Survey 2009: common oral health conditions and their impact on the population. *British dental journal* 213(11): 567-572.
8. Botelho J, Vicente F, Dias L, Júdice A, Pereira P, et al. (2021) Periodontal Health, Nutrition and Anthropometry in Professional Footballers: A Preliminary Study. *Nutrients* 13(6): 1792.
9. Ashley P, Di Iorio A, Cole E, Tanday A, Needleman I (2015) Oral health of elite athletes and association with performance: a systematic review. *British journal of sports medicine* 49(1): 14-19.
10. Clarsen B, Myklebust G, Bahr R (2013) Development and validation of a new method for the registration of overuse injuries in sports injury epidemiology: the Oslo Sports Trauma Research Centre (OSTRC) overuse injury questionnaire. *British journal of sports medicine* 47(8): 495-502.
11. Eberhard J, Stiesch M, Kerling A, Bara C, Eulert C, et al. (2014) Moderate and severe periodontitis are independent risk factors associated with low cardiorespiratory fitness in sedentary non-smoking men aged between 45 and 65 years. *Journal of clinical periodontology* 41(1): 31-37.
12. Gallagher J, Ashley P, Petrie A, Needleman I (2019) Oral health-related

behaviours reported by elite and professional athletes. British dental journal 227(4): 276-280.

13. Oliveira J A, Hoppe C B, Gomes M S, Grecca F S, Haas A N (2015) Periodontal disease as a risk indicator for poor physical fitness: a cross-sectional observational study. Journal of periodontology 86(1): 44-52.

14. Collins J, Maughan R J, Gleeson M, Bilsborough J, Jeukendrup A, et al. (2021) UEFA expert group statement on nutrition in elite football. Current evidence to inform practical recommendations and guide future research. British journal of sports medicine 55(8): 416.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2023.48.007697

: Castaldi Matteo . Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



#### Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>