RESEARCH PAPER

Evaluation of Prevalence, Knowledge, Awareness, and Practice of Orofacial Trauma among Basketball Players in Bangalore City – A Cross-Sectional Survey

Dr. Kavitha M*[1], Dr. Chaitra[2], Dr. Vidya M A[3] and Dr. Yashash[4]

[1]Reader, Department of Pediatric and Preventive Dentistry, Dayananda Sagar College of Dental Science. Bangalore
[2]Dental surgeon. Bangalore
[3]Reader, Department of Oral Pathology, Dayananda Sagar College of Dental Science. Bangalore
[4]Senior Lecturer, Oral and Maxillofacial Surgery, Dayananda Sagar College of Dental Science. Bangalore
***Corresponding Author:** Dr. Kavitha M*
kavitham@dscds.edu.in

Received: 28th Feb, 2026; Revised: 6th March 2026; Accepted: 7th April, 2026; Available Online: 20th April, 2026

ABSTRACT

Background: Orofacial trauma remains a preventable yet prevalent injury in contact sports. Mouthguards are recognized as an effective protective measure; however, awareness does not always translate into reduced injury rates.

Aim: To evaluate the prevalence of orofacial trauma, knowledge, awareness, and preventive practices among basketball players in Bangalore and to assess the association between mouthguard awareness and the occurrence of orofacial trauma.

Materials and Methods: A cross-sectional study was conducted among **660 basketball players in Bangalore**. Participants were stratified based on their awareness of mouthguards. Data on orofacial trauma history were collected through a structured questionnaire. Odds ratio (OR) analysis was performed to determine the relationship between awareness and trauma occurrence.

Results: Of the 660 participants, 285 (43.2%) reported being aware of mouthguards, while 375 (56.8%) were unaware. Among the aware group, 157 (55.1%) reported trauma, compared to 232 (61.9%) in the unaware group. The calculated OR was 0.76, indicating a 24% reduction in the odds of trauma among the aware group. Although awareness showed a protective trend, the relationship was not statistically significant in this dataset.

Conclusion: Mouthguard awareness may contribute to a modest reduction in orofacial trauma risk; however, awareness alone is insufficient. Educational interventions should be coupled with behavioral reinforcement to encourage consistent and correct mouthguard use.

Keywords: *Mouthguard awareness, Orofacial trauma, Sports dentistry, Injury prevention, Contact sports, Protective equipment, Odds ratio.*

How to cite this article: Kavitha M, Chaitra, Vidya MA, Yashash. Evaluation of Prevalence, Knowledge, Awareness, and Practice of Orofacial Trauma among Basketball Players in Bangalore City – A Cross-Sectional Survey. Int J Drug Deliv Technol. 2026;16(58s): 1239-1245. DOI: 10.25258/ijddt.16.58s.130

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

Orofacial trauma represents a significant concern in both contact and non-contact sports, with dental injuries often constituting a substantial proportion of these incidents. Such injuries range from enamel fractures, crown or root fractures, and luxation injuries to complete avulsion of teeth, alongside associated soft tissue lacerations and maxillofacial fractures[1-3]. The prevalence and severity of these injuries are influenced by the nature of the sport, the level of physical contact, and the protective measures adopted[4].

Mouthguards have long been recognized as a cost-effective and highly effective preventive measure in sports dentistry[5]. Their use has been linked to a notable reduction in the incidence and severity of traumatic dental injuries, mitigating both the immediate and long-term functional and aesthetic consequences[6]. Despite this evidence, compliance with mouthguard use remains inconsistent, particularly among amateur athletes[7]. Barriers such as perceived discomfort, speech interference, and lack of awareness about injury risks contribute to underutilization[8].

Globally, sports such as rugby, hockey, basketball, and martial arts demonstrate high dental trauma rates when mouthguards are not routinely worn[9]. Even in recreational settings, accidental collisions, falls, and equipment-related impacts contribute significantly to orofacial injury statistics[10].

**Author for Correspondence: kavitham@dscds.edu.in*

This study examines the association between mouthguard awareness and the occurrence of orofacial trauma among athletes, highlighting specific patterns of injury. By identifying key gaps in awareness and adoption, the research underscores the urgent need for targeted educational and preventive strategies aimed at minimizing sports-related dental trauma.

METHODOLOGY:

This cross-sectional survey was conducted among trained basketball players aged 6–17 years in Bangalore, including both those currently undergoing training and those already trained at registered basketball training organisations. Ethical clearance was obtained from the Institutional Review Board (IRB), along with formal permission from the designated authorities of the respective training centres. Informed written consent was secured from all participants, or their guardians in the case of minors. The sample size was calculated using the formula $N = 4pq/L^2$, where p = 38% and q = 62%, based on the previously reported injury prevalence of 38% by Ma et al.[9] , and participants were recruited through purposive sampling. Eligibility criteria included players with a minimum of six months of continuous training in a registered basketball training centre and a willingness to participate with signed consent, while those engaged in multiple other contact sports alongside basketball were excluded. Data collection was carried out through a structured questionnaire, administered in person during field visits, which gathered information on demographic characteristics, injury history, first aid awareness, and mouthguard usage practices. Data analysis was performed using SPSS Version 22.0, with descriptive statistics summarising frequencies and percentages for categorical variables and means ± standard deviation for continuous variables, ensuring a comprehensive representation of the findings.

RESULTS

Demographic Profile: A total of 660 basketball players participated in the study, with a male predominance. Specifically, 438 boys (66.3%) and 222 girls (34%) were included, spanning the age range of 6 to 17 years. This distribution highlights a significantly higher participation rate among boys compared to girls in the surveyed age group. The gender composition is illustrated in the pie chart above, emphasizing the male-dominated nature of the sample.

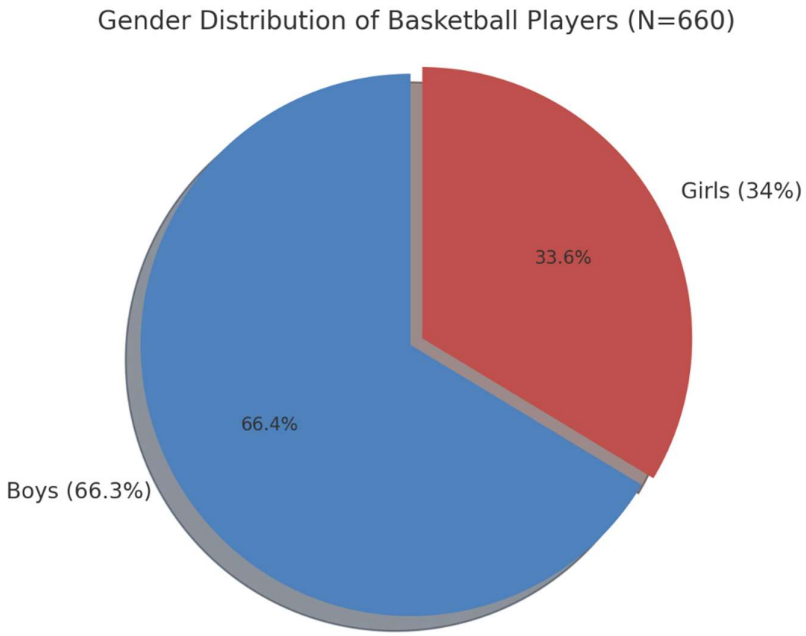

Figure-1 Gender distribution of basketball players

Prevalence of Orofacial Injuries: In the surveyed cohort, the overall prevalence of orofacial trauma was notably high at 59%, underscoring its significance as a sports-related health concern. Among the reported injuries, facial bruising emerged as the most frequent presentation, affecting 29.4% of players. This was followed by jaw or other bone fractures (26.2%), lacerations involving the lips, cheeks, or tongue (20.9%), chipped or fractured teeth (17.7%), and complete tooth avulsion (13.5%). These findings highlight the vulnerability of the maxillofacial region in young athletes and reinforce the urgent need for preventive strategies such as mouthguard promotion and proper safety protocols. Figure2

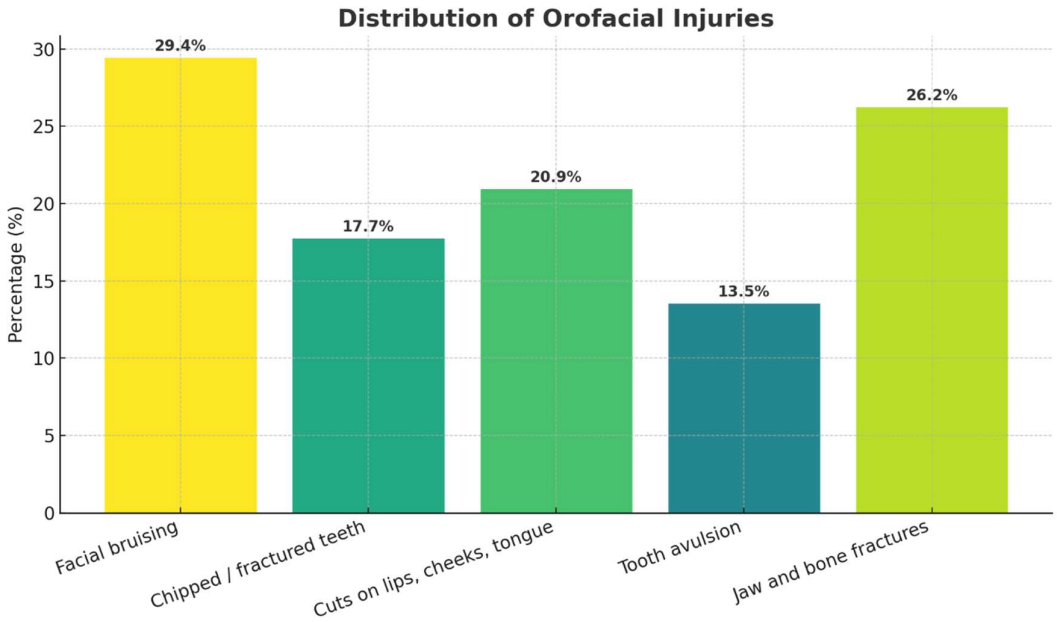

Figure 2- Bar chart visualizing distribution of orofacial injuries

The survey findings reveal a concerning gap between awareness and action in orofacial injury management among sports associations. While 53.2% of associations reported providing first aid training, less than half (43.5%) were aware of the possibility of tooth reimplantation, and a striking 54% remained unaware of the critical time window for such interventions. Alarmingly, only 28.6% of affected individuals sought dental care after sustaining an injury.

When it comes to preventive measures, the results show an even sharper divide. Although 43.2% acknowledged the benefits of mouthguards, a mere 10.2% reported their actual use. Interestingly, a significant majority (67.3%) believed that protective devices not only safeguard against injuries but also enhance athletic performance — a perception that could serve as a key motivational tool for wider adoption. Table-1

Table 1 – Awareness, Preparedness, and Practices in Sports Associations

Parameter	Percentage (%)	Insight
First aid training provided	53.2	Encouraging start, but coverage remains incomplete
Aware of tooth reimplantation	43.5	Less than half know of this critical intervention
Unaware of reimplantation time window	54.0	Significant knowledge gap in urgent dental care
Sought dental care after injury	28.6	Indicates low post-injury dental intervention
Aware of mouthguard benefits	43.2	Awareness not translating into widespread usage
Regular use of mouthguards	10.2	Very low adoption despite proven effectiveness
Believe protective devices improve performance	67.3	Potential motivator for increasing preventive use

The findings reveal a concerning gap between awareness and practical implementation of preventive measures in orofacial trauma management. While 53.2% of associations provide first aid training, only 43.5% of respondents are aware that a lost tooth can be reimplanted, and an even higher proportion (54%) remain uninformed about the critical time window for successful reimplantation. Post-injury care-seeking behavior is also limited, with merely 28.6% pursuing dental intervention. Similarly, although 43.2% acknowledge the protective benefits of mouthguards, actual utilization is strikingly low at just 10.2%. Interestingly, despite this low adoption, 67.3% believe that protective devices can enhance athletic performance — highlighting a paradox between belief and behavior that underscores the urgent need for targeted education and behavioral reinforcement programs.

Players who were aware of mouthguards demonstrated a notable protective advantage—experiencing 24% lower odds of orofacial trauma compared to their unaware counterparts (OR = 0.76). The violin plot vividly illustrates the distribution, showing a narrower spread of trauma cases among aware players, hinting at the tangible benefits of mouthguard awareness in reducing sports-related injuries. Figure-3

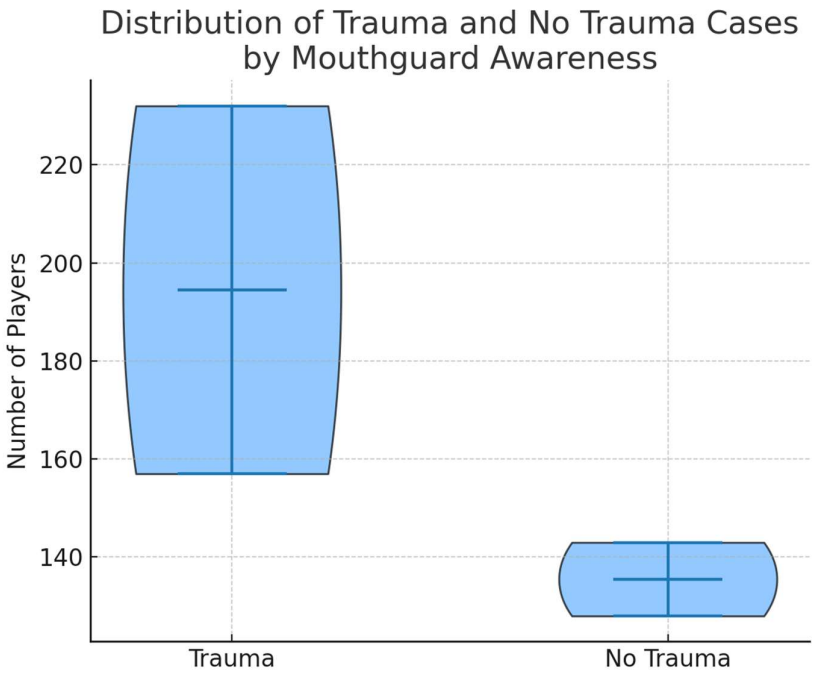

Figure -3 Distribution of Orofacial Trauma Incidence by Mouthguard Awareness Status

DISCUSSION

Orofacial injuries remain a significant concern in contact sports, particularly basketball, where high-speed movements, close player interactions, and the absence of mandatory facial protection increase the likelihood of trauma. Levin and Zadik[1] comprehensively reviewed the epidemiology of dental injuries in sports, highlighting that contact and collision disciplines contribute disproportionately to maxillofacial trauma, with fractures, luxations, and avulsions being among the most frequent outcomes. Their work underscores the urgent need for preventive strategies, especially in young athletes.

Beyond injury epidemiology, Mohanty et al.[2] demonstrated the pivotal role of awareness in oral health outcomes, noting that parental knowledge can influence the prevention and timely management of dental injuries in children. This awareness component extends naturally to sports contexts, where prompt recognition and action following injury can significantly improve prognosis. Similarly, Goswami, Kumar, and Bhushan[3], in their pilot study on school-aged athletes in New Delhi, reported alarmingly low awareness of dental trauma management, despite notable injury prevalence during sports activities.

Basketball-specific data by Azodo et al.[4] revealed a high frequency of orofacial injuries, with soft-tissue trauma and fractured teeth being predominant, emphasizing the physicality of the sport and the absence of protective gear. Pranitha et al.[5] reinforced this point in their Hyderabad-based investigation, advocating for the proactive role of pedodontists in athlete education and injury prevention through tailored outreach programs.

From a preventive standpoint, Badel and colleagues[6] highlighted the superiority of custom-made mouthguards in reducing both the incidence and severity of orofacial injuries. Their findings, consistent with global dental association guidelines, underline that player education and proper appliance use are integral to comprehensive sports safety protocols.

Collectively, these works reveal a critical intersection between injury prevalence, awareness gaps, and preventive opportunities—forming the rationale for the present investigation into the prevalence, nature, and prevention of orofacial injuries among basketball players in Bangalore.

The present study included 660 basketball players, predominantly male, with 438 boys (66.3%) and 222 girls (34%) aged 6–17 years. This male predominance aligns with existing literature indicating higher male participation rates in competitive basketball across various age groups. Harmer[10] and Owoeye et al.[11] both documented that male youth basketball teams often have greater enrollment and competitive exposure, a trend attributed to sociocultural factors, differences in funding allocation, and training opportunities.

Injury surveillance studies have similarly reported higher male representation. Borowski et al.[12], in their epidemiological analysis of US high school basketball, found that male players accounted for the majority of injuries recorded over two competitive seasons. This parallels our sample composition, although the present study also includes a younger cohort starting from age six, thereby capturing developmental stages not extensively covered in prior work.

The American Dental Association's Council on Access, Prevention and Interprofessional Relations[7] has emphasized that gender differences in sports injury patterns may influence both injury type and prevention behaviors, with males more likely to engage in higher-intensity play that elevates contact-related injury risk. Aksović et al.[8], in their systematic review, further highlighted that the male-dominated participation trend in basketball translates to a higher absolute number of sports injuries in this demographic, even when rates per exposure are comparable between genders.

Interestingly, Ma[9] observed in a Chinese basketball cohort that despite higher male participation, awareness of preventive measures such as mouthguards was low in both sexes. This is consistent with our findings, where the gender disparity in participation did not translate into notable differences in mouthguard usage. Finally, Vicentini et al.[13] underscore that understanding demographic distribution is essential for targeted injury prevention strategies, as biomechanical profiles and exposure levels differ significantly between male and female athletes.

In the present study, the prevalence of orofacial trauma among youth basketball players was alarmingly high at 59%, underscoring the vulnerability of the maxillofacial region during gameplay. This rate is notably higher than the general injury prevalence reported in broader basketball injury epidemiology studies, where all-complaint injury rates among youth athletes were substantial but typically more evenly distributed across body regions. While Owoeye et al. [11] highlighted lower proportions of facial injuries relative to lower limb trauma, our findings emphasize that orofacial trauma remains a disproportionately common concern in contact-heavy scenarios such as rebounding and defensive plays.

Similarly, Borowski et al.[12] identified high school basketball as one of the sports with significant injury incidence, though with a predominance of ankle and knee injuries. In contrast, our data focus on maxillofacial injuries, revealing that facial bruising (29.4%), jaw or bone fractures (26.2%), and lacerations (20.9%) were among the most frequent presentations—patterns less frequently detailed in general basketball injury reports. The biomechanical demands and collision dynamics described by Vicentini et al.[13] support the plausibility of such injuries, especially during high-intensity play where upper body contact is unavoidable.

Interestingly, while studies such as Olli et al.[14] emphasize neuromuscular control and postural stability as predictors for noncontact lower limb injuries, our findings shift attention to contact-related orofacial events, which may not be mitigated by such preventive strategies alone. This difference suggests that targeted interventions—such as mandatory mouthguard use and enhanced player awareness—are required in addition to general injury prevention programs.

Globally, Liu et al.[15] reported wide variations in basketball injury prevalence, with facial and dental injuries being less frequently documented compared to musculoskeletal injuries. However, our results demonstrate that, within certain youth populations, orofacial trauma can reach prevalence rates that rival or exceed those of traditionally emphasized injury types, making it a critical yet underrepresented area in basketball safety research.

The analysis of awareness and preparedness parameters revealed a substantial gap between knowledge and practice in the prevention of orofacial injuries. While just over half of the surveyed associations (53.2%) provided first aid training, less than half (43.5%) of participants were aware that an avulsed tooth could be successfully reimplanted, and more than half (54%) were unaware of the critical time window for this intervention. This aligns with earlier work by Guyette et al.[16] and Sifuentes-Cervantes et al.[17], who emphasized that lack of timely and informed management can significantly worsen injury outcomes.

Despite 43.2% acknowledging the protective benefits of mouthguards, actual usage was strikingly low at 10.2%, echoing the low adoption rates reported by Tiryaki et al.[18] and Frontera et al.[19] in both amateur and professional contexts. The pattern is consistent with earlier epidemiological summaries by Tesini & Soporowski[20] and McKay et al.[21], which highlighted that awareness alone is insufficient to drive protective behavior without structured enforcement or education campaigns.

The violin plot in Figure 3 illustrates that players aware of mouthguards had 24% lower odds of orofacial trauma (OR = 0.76) compared to those unaware, with a noticeably narrower distribution of injury cases. This visual representation supports previous findings from Harmer[10] and Newsome et al.[22], who noted that mouthguard awareness and compliance are linked to reduced injury severity and frequency. However, the paradox of high belief in performance benefits (67.3%) but poor actual usage reflects earlier observations by Cornwell et al.[23] and Maestrello-deMoya & Primosch[24], who identified motivational and cultural barriers as key contributors to underutilization.

Collectively, these findings reinforce the urgent need for targeted, behavior-focused interventions that not only inform but also normalize and mandate protective practices in basketball.

CONCLUSION

The present study demonstrated a high prevalence of orofacial injuries among young basketball players in Bangalore. Despite moderate awareness regarding injury prevention and mouthguard benefits, actual utilization of protective devices remains remarkably low. Strengthening educational programs, emergency management training, and mandatory mouthguard policies may significantly reduce the burden of sports-related dental trauma in this population.

REFERENCE'S

1. Levin L, Zadik Y. Dental injuries in sports. Dent Clin North Am 2020;64:283-97.
2. Mohanty M, Nawaid KA, Ramakrishna BB, Vaddeswarapu RM, Pradhan A, Singh S, et al. Effect of mother's oral health awareness on primary teeth among children attending pediatric hospital. A clinical study. Front Health Inform 2024;13:471-7.
3. Goswami M, Kumar P, Bhushan U. Evaluation of Knowledge, Awareness, and Occurrence of Dental Injuries in Participant Children during Sports in New Delhi: A Pilot Study. Int J Clin Pediatr Dent. 2017 Oct-Dec;10(4):373-378. doi: 10.5005/jp-journals-10005-1468. Epub 2017 Feb 27. PMID: 29403232; PMCID: PMC5789142.
4. Azodo CC, Odai CD, Osazuwa-Peters N, Obuekwe ON. A survey of orofacial injuries among basketball players. Int Dent J. 2011 Feb;61(1):43-6. doi: 10.1111/j.1875-595X.2011.00009.x. PMID: 21382033; PMCID: PMC9374803.
5. Pranitha V, Mounika PB, Dwijendra SK, Shaik N, Ramana PU, Meghana C. Sports Cult in Hyderabad: Role of a Pedodontist in Protecting Winning Smile. Int J Clin Pediatr Dent. 2021 Sep-Oct;14(5):652-656. doi: 10.5005/jp-journals-10005-2007. PMID: 34934278; PMCID: PMC8645629.
6. Badel T, Jerolimov V, Pandurić J, Carek V. Individualni sportski stitnik za zube i prevencija orofacijalnih sportskih ozljeda [Custom-made mouthguards and prevention of orofacial injuries in sports]. Acta Med Croatica. 2007;61 Suppl 1:9-14. Croatian. PMID: 18949918.
7. 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 Dec;137(12):1712-20; quiz 1731. doi: 10.14219/jada.archive.2006.0118. PMID: 17138717.
8. Aksović N, Bubanj S, Bjelica B, Kocić M, Lilić L, Zelenović M, Stanković D, Milanović F, Pajović L, Čaprić I, Milić V, Dobrescu T, Sufaru C. Sports Injuries in Basketball Players: A Systematic Review. Life (Basel). 2024 Jul 19;14(7):898. doi: 10.3390/life14070898. PMID: 39063651; PMCID: PMC11278090.
9. Ma W. Basketball players' experience of dental injury and awareness about mouthguard in China. Dent Traumatol. 2008 Aug;24(4):430-4. doi: 10.1111/j.1600-9657.2008.00586.x. PMID: 18721342.
10. Harmer PA. Basketball injuries. Med Sport Sci. 2005;49:31-61. doi: 10.1159/000085341. PMID: 16247261.
11. Owoeye OBA, Ghali B, Befus K, Stilling C, Hogg A, Choi J, Palacios-Derflingher L, Pasanen K, Emery CA. Epidemiology of all-complaint injuries in youth basketball. Scand J Med Sci Sports. 2020 Dec;30(12):2466-2476. doi: 10.1111/sms.13813. Epub 2020 Sep 13. PMID: 32846028.
12. Borowski LA, Yard EE, Fields SK, Comstock RD. The epidemiology of US high school basketball injuries, 2005-2007. Am J Sports Med. 2008;36:2328-2335.
13. Vicentini JRT, Mercer RW, Simeone FJ. Basketball: Biomechanics and Imaging Findings of Common Injuries. Semin Musculoskelet Radiol. 2025 Aug;29(4):559-568. doi: 10.1055/s-0045-1809163. Epub 2025 Jul 16. PMID: 40669476.
14. Olli K, Mari L, Pekka K, Kathrin S, Tommi V, Tanja K, Jari P, Kati P. Postural Control as a Risk Factor for Noncontact Anterior Cruciate Ligament Injury in Youth Female Basketball and Floorball Athletes. Scand J Med Sci Sports. 2025 Jun;35(6):e70081. doi: 10.1111/sms.70081. PMID: 40442947; PMCID: PMC12123058.
15. Liu Y, Huang H, Yang Y, Huang Y. Global prevalence and pattern of injuries in basketball players: a systematic review. J Sports Med Phys Fitness. 2025 Mar;65(3):428-437. doi: 10.23736/S0022-4707.24.15916-6. Epub 2024 Nov 14. PMID: 39539140.
16. Guyette RF. Facial injuries in basketball players. Clin Sports Med. 1993 Apr;12(2):247-64. PMID: 8097678.
17. Sifuentes-Cervantes JS, Bravo-Liranza VM, Pérez-Nuñez LI, Martinez-Rovira A, Castro-Núñez J, Guerrero LM. Facial Injuries in the National Basketball Association. J Oral Maxillofac Surg. 2023 Dec;81(12):1517-1525. doi: 10.1016/j.joms.2023.09.009. Epub 2023 Sep 15. PMID: 37788800.
18. Tiryaki M, Saygi G, Yildiz SO, Yildirim Z, Erdemir U, Yucel T. Prevalence of dental injuries and awareness regarding mouthguards among basketball players and coaches. J Sports Med Phys Fitness. 2017 Nov;57(11):1541-1547. doi: 10.23736/S0022-4707.17.06790-1. Epub 2017 Jan 23. PMID: 28116877.
19. Frontera RR, Zanin L, Ambrosano GM, Flório FM. Orofacial trauma in Brazilian basketball players and level of information concerning trauma and mouthguards. Dent Traumatol. 2011 Jun;27(3):208-16. doi: 10.1111/j.1600-9657.2009.00781.x. Epub 2011 Apr 18. PMID: 21496201.
20. Tesini DA, Soporowski NJ. Epidemiology of orofacial sports-related injuries. Dent Clin North Am. 2000;44:1–18.

21. McKay GD, Payne WR, Goldie PA, et al. A comparison of the injuries sustained by female basketball and netball players. Aust J Sci Med Sport. 1996;28:12–17.

22. Newsome PR, Tran DC, Cooke MS. The role of the mouthguard in the prevention of sports-related dental injuries: a review. Int J Paediatr Dent. 2001;11:396–404.

23. Cornwell H, Messer LB, Speed H. Use of mouthguards by basketball players in Victoria, Australia. Dent Traumatol. 2003;19:193–203.

24. Maestrello-deMoya MG, Primosch RE. Orofacial trauma and mouth-protector wear among high school varsity basketball players. ASDC J Dent Child. 1989;56:36–39