Dental Traumatology

Dental Traumatology 2009; **25**: 318–322; doi: 10.1111/j.1600-9657.2009.00769.x

Use of mouthguard rates among university athletes during sport activities in Erzurum, Turkey

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Accepted 4 January, 2009

Abstract – The purpose of this study was to determine the attitudes of mouthguard users in Erzurum, Turkey. The participants' appreciation in the use of protective devices, such as mouthguards, during sport activities was also evaluated. In this study, a 10-item questionnaire was distributed to 50 coaches and a 10-item questionnaire was distributed to 768 university athletes of three different sport modalities (basketball, soccer and volleyball) in the Atatürk University Sport Competitions. The Sport Competitions are composed of 20 faculty, except the faculty of dentistry. The result of the coaches' questionnaires indicated that none of the athletes used mouthguards while participating in sports. Of the coaches, 64% had seen orofacial trauma in their athletes during sport activities and 76% believed that mouthguards prevented oral injuries. Of the coaches, 76% reported that university athletes should use mouthguards in sport activities. The result of the university athletes' questionnaires revealed that the mouthguard utilization rate was 0%. Of all players, 78.1% were males (age 17–29) and 21.9% were females (age 18–23). Of all players, 7.31% had suffered from one or more type of oral injury while not wearing mouthguards. The results indicate that in Turkey, the use of mouthguards is rare in sports. It should be a combined duty of dentists, sports physicians, and coaches to encourage the use of mouthguards during training and sport activities. Doctors and dentists need to recommend a more intensive education of students in sports medicine and sports dentistry.

Dental injuries are the most common type of orofacial injury sustained during participation in sports (1–3). The current public popularity of contact sports and the willingness to take high risks in sport have led to an increase in sport injuries (4–8). Sporting accidents are one of the most common causes of facial injuries. Studies on large groups have shown that sports account for 31% of such trauma in adults and children (9, 10). When the face and head are involved, this often results in tooth or mouth trauma. A blow to the face can not only cause tooth or soft tissue injuries, but can also result in fractures of the jaw or facial bones, or even cerebral damage. The subsequent esthetic, functional, psychological, and economic impact (often with high follow-up costs) demonstrate the importance of prevention. Different studies have demonstrated that wearing a mouthguard can significantly reduce the incidence of orofacial injuries (4, 11–15). Athletic mouthguards were used extensively for the prevention of intraoral trauma in sports (16, 17). The increasing popularity of all sporting events results in an increased potential for injuries across a wide range of both organized and unorganized sports (18, 19). Since the 1950s, mouthguards have been mandated in US American football at high school and college levels. In 1962 the National Alliance Football Rules Committee enacted a rule to mandate the use of facemasks and mouthguards for the first time for football players in high school and junior college. Heintz reported that in the US this regulation has significantly reduced the rate of orofacial injuries (11). The National Collegiate Athletic Association mandated a similar rule in 1973 (20). Josell and Abrams (21) report that mouthguards may help prevent concussion, cerebral hemorrhage, and possibly death, by separating the jaws, and thus preventing the mandibular condyles from being displaced upward and backward against the wall of the glenoid fossa. Other protective roles of mouthguards are:

1 preventing the tongue, lips and cheeks from laceration against the teeth;
2 lessening the risk of injury to anterior teeth following a frontal blow;
3 lessening the risk to posterior teeth of either arch (22).

Johnsen and Winters (16) report that while protecting against injuries, mouthguards may have disadvantages.

1 Comfort: they may be uncomfortable because of improper fit;
2 Tissue reaction: because of either improper fit or as a result of a traumatic blow to the oral cavity, there can be tissue reactions. However, the severity of the injury may be even worse without a mouthguard in place.

3 Function and maintenance: mouthguards can impair normal breathing and normal speech, or restrict the intake of fluids.

Ranalli and Lancaster (23, 24) report that despite growing evidence in favor of the importance of mouthguards in injury prevention, agreement to its recommended mandatory use in sports is not universal. Attitudes of coaches, officials, parents, and players toward wearing mouthguards influence their usage. Studies reveal that coaches are the individuals with the highest impact on whether or not players wear mouthguards. Çetinbaş and Sönmez (25) report that none of the students of these Turkish coaches use mouthguards during sport activities. The purpose of the present study was to determine the extent of mouthguard use, as well as the frequency of oral trauma in these athletes.

Materials and methods

The study consisted of 50 coaches all of whom were male selected from Faculties of Atatürk University in Erzurum, Turkey. Distribution of sports and coaches are presented in Table 1. The Sport Competitions are composed of 20 faculty. Faculty of dentistry was excluded from the study because the coach of the sport team of the faculty of dentistry is a dentist. A 10-item self completion questionnaire was distributed to these coaches. Table 2 represents the questions of the coaches' questionnaire which was developed from previous surveys (18, 25–27). The questionnaire sought information about what sport(s) they coached, the experience they had as a coach, the rate of oral trauma they had observed in athletes during sport activities, whether they believed that mouthguards should be used by athletes, and in what sports they believe participants should be required to wear mouthguards. They were also asked whether any of their athletes used mouthguards, whether they felt that mouthguards prevented oral injuries, whether they would like to have more information on mouthguards and the different types (25), whether they think that a mouthguard influences the athletes' performance, and what are the possible reasons for their athletes not wearing mouthguards during sport activities. All coaches participating in the study completed the questionnaire. Interviews were conducted with 768 Atatürk University students who were on the soccer, basketball, and volleyball team of various faculties except the faculty of dentistry because all their students used a mouthguard for another study. Distribution of sports and coaches is presented in Table 3. The survey was conducted on the teams whose coaches' gave permission. Table 4 represents the athletes' questionnaire. Each athlete was asked a series of questions concerning the type of sport practiced, his/her awareness and use of a mouthguard, whether a mouthguard was owned, and any history of oral trauma while participating in sports. Positive responses prior to trauma were qualified concerning the type and location of the injury. Because none of the athletes have a mouthguard, the athletes were not asked whether they had any complaints while wearing the mouthguards. The participants' use of a mouthguard during games was also encouraged.

Table 1. Distribution of sports and coaches

Sports	Number of coaches	Percentage
Volleyball	19	38
Soccer	18	36
Basketball	13	26
Total	50	100

Table 2. Coaches' questionnaire

Name:
Surname:
Faculty:
Old:
1. What sport(s) do you coach?
2. What is your experience as a coach?
3. Have you ever seen any oral injuries in athletes during sport activities?
○ Yes
○ No
4. Do you believe that mouthguards prevent oral injuries?
○ Yes
○ No
5. Do you think that mouthguards influences that athletes' performance?
○ Yes
○ No
6. Do any of your athletes wear mouthguard?
○ Yes
○ No
7. In what sports do you think that participant require wearing mouthguards?
8. Is there any sort of education of sport injuries in your club?
○ Yes
○ No
9. Would you like to have more information about mouthguards and its types?
○ Yes
○ No
10. Note possible reasons why athletes don't wear a mouthguard?

Table 3. Distribution of sports and athletes

Sports	Males	Females	Total	*n* (%)
Volleyball	120	108	228	29 (69%)
Basketball	168	48	216	28 (12%)
Soccer	324	0	324	42 (19%)
Total	612	156	768	100%
n (%)	79 (69%)	20 (31%)	100%	

Results

Table 3 shows the sports and distribution of athletes. Interviews were conducted with 768 university students on soccer, basketball, and volleyball teams. Of them, 78.1% were males and 21.9% were females with a mean age of 21.68 years. The results of the coaches' questionnaire are given in Table 5. The experience of the coaches ranged 1–30 years with a mean experience of 13.62 years. Distribution of the sports and the coaches shown in Table 1 reveals that volleyball (38%) had the highest number of coaches followed by soccer (36%) and

Table 4. Questionnaire for athletes

Name:
Surname:
Age:
1. What sports do you participate?
2. Did you practice as a professional athlete or amateur?
○ Professional
○ Amateur
3. Do you wear a mouthguard?
○ Yes
○ No
4. If yes, which type of mouthguard do you own?
○ Stock
○ Mouth-formed
○ Custom-fabricated
5. If you have a mouthguard when do you use it?
○ Games only
○ Games and exercises
6. Have you suffered any kind of dental trauma during sport activities?
○ Yes
○ No
What kind of?
……
7. If you had, were you wearing a mouthguard at that time?
○ Yes
○ No
8. Do you have any complaints while using a mouthguard? What kind of?
○ Speech
○ Breathing
○ Dry mouth
○ Bad taste and odor
○ Nausea
○ Other …
9. What are the reasons for not wearing a mouthguard?
10. Is it necessary to make the use of a mouthguard mandatory in your sport?
○ Yes
○ No

Table 5. Coaches' responses to questionnaire

	n (%)
The sports they coached	
Volleyball	19 (38)
Basketball	18 (36)
Soccer	13 (26)
The rate of oral traumas reported	
Yes	32 (64)
No	18 (36)
Sports requiring the use of mouthguards	
Martial arts	14 (35)
Boxing	14 (35)
Basketball	4 (10)
Handball	2 (05)
Soccer	2 (05)
Ski	2 (05)
All sports	2 (05)
The rate of students using a mouthguard stated by the coaches	
Yes	0 (00)
No	50 (100)
The rate of coaches believing mouthguards prevent oro-facial injuries	
Yes	38 (76)
No	12 (24)
The rate of coaches influencing their students to use a mouthguard	
Yes	0 (00)
No	50 (100)
The rate of coaches wanting more information about mouthguards	
Yes	39 (78)
No	11 (22)

Table 6. Distribution of the athletes' answers to the interview

	n (%)
The sports participated	
Soccer	324 (42.2)
Volleyball	228 (29.7)
Basketball	216 (28.1)
The rate of using a mouthguard	
Yes	0 (0)
No	768 (100)
The rate of dental trauma	
Yes	76 (10)
No	692 (90)
The gender ratio of dental trauma	
Female	0 (0)
Male	76 (100)
The rate of professional athletes	72 (9.4)
The rate of amateur athletes	696 (90.6)
The type of the orofacial injuries	
Soft tissue injuries	38 (50)
Teeth injuries	38 (50)

basketball (26%). Of the coaches, 64% had seen orofacial injuries in athletes. Of the coaches, 76% believed that mouthguards should be worn by athletes during sport activities. The coaches' responses to the question as to which sports should require the use of a mouthguard is shown in Table 5. Of the coaches, 76% felt that mouthguards prevented orofacial injuries. In this study, none of the students used a mouthguard as stated by the coaches. Also, 78% of the coaches said they would like more information on mouthguards while 22% claimed that they did not need any. Table 6 represents the answers of the athletes' interview. None of them had used a mouthguard. Of all players, 10% reported having sustained some form of orofacial injury previously. None of the female athletes have suffered any orofacial injury. The type of orofacial injuries that athletes suffered were soft tissue injuries (50%) and injuries to the teeth (50%).

Discussion

Injuries to the orofacial area often mean lifelong sequelae with considerable follow-up costs. Different studies have shown that such injuries could be prevented by wearing a mouthguard (6, 26–28). Stenger et al. (29) reported that in football, with the introduction of face masks, dental injuries were reduced to almost half (50%) and with the addition of mouthguards the number of dental injuries in this sport decreased to 1.4%. The present study examined the type and frequency of orofacial injuries and the use of mouthguards by athletes (soccer, volleyball, and basketball) in Atatürk University. Furthermore, the

attitude of officials towards the use of mouthguards was analyzed. In line with previous studies (14, 30, 31), there are large variations between the different sports concerning the acceptance of wearing a mouthguard. Although over 40% of all players approved the use of a mouthguard, none actually used one. The most common injuries reported were soft tissue lacerations and tooth fractures. Surprisingly in soccer, cerebral concussion was a common finding. The use of mouthguards as a necessity in soccer, despite the relatively low rate of orofacial injuries, remains a controversial issue. In fact, the study by Labella et al. (32) could not show any differences in the concussion rate of basketball players with or without mouthguards. The present study demonstrates a cognitive dissonance between attitudes of coaches and their feelings about mouthguards. The results of this study show that the majority of the Turkish coaches agreed on the protective roles of mouthguards against sports-related orofacial injuries, but they do not advise or try to influence the adolescent athletes to use one. It was found that 78% of the coaches would like to have more information on mouthguards. The present study suggests the need for more education of these coaches on the importance of mouthguards for their athletes. Dentists should be more involved in providing information to athletic groups. To this end, courses for coaches would be beneficial. The orofacial trauma rate in this study group was 10%. Further research is needed to determine the risk of orofacial injury in all contact sports in Turkey. In the present survey, it was found that the level of usage, knowledge, and awareness regarding the benefits of using mouthguards in Turkey are minimal. Dentists as well as other healthcare professionals should educate players, parents, and coaches in order to promote the use of mouthguards in professional and amateur sports, especially for adolescents. Dental professionals, especially pediatric dentists, should regularly question patients' parents about sports participation and inform them about orofacial injury risk and suggest the use of a mouthguard.

Conclusion

The study showed that the majority of Turkish coaches agree on the benefits of mouthguards but their knowledge is limited. Likewise, university athletes do not use mouthguards and they do not have much information about professionally fitted mouthguards. It was concluded that the use of mouthguards during professional or amateur sport activities should be promoted in Turkey.

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