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Evaluation of Turkish Athletes' Awareness Regarding the Use of Mouthguards

Türk Sporcuların Ağız Koruyucu Kullanımına İlişkin Farkındalıklarının Değerlendirilmesi

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ABSTRACT

Objective: To examine the awareness of Turkish athletes about mouthguard use and to make mouthguard use routine.
Methods: This cross-sectional study is aimed to determine the knowledge about the advantage of mouthguard use of athletes. Participants over the age of 18 who answered all questions were included in this study. Those who refused to participate in the survey were excluded. A face-to-face survey including 10 questions was made. The questionnaire were given on a day and collected the next day.
Results: There was a significant difference between protection awareness and use of Mouthguard (P<.05). 218 (90.1%) athletes were aware of mouth guards, but only 57 (26.1%) were using them. In addition, out of 141 (58.2%) athletes who saw athletes with mouth injuries, only 48 (34%) were using mouthguards. Though 120 (49.5%) athletes received training on sports injuries, 76 (63%) participants still do not use mouthguards. They do not use mouthguards due to harmfulness on concentration and performance, difficulty in breathing, lack of education, economic difficulties, nausea. Among them, the most stated reason is that their performance and concentration will decrease with 44%. 72% of the participants think that contact and fight sports should use mouthguards at the highest rate compared to other branches.
Conclusion: This study showed that although Turkish athletes agree on the benefits of mouth guards, their education about mouthguards is limited. Education and awareness mouthguards usage in athletes in Turkey should be encouraged.
Keywords: Awareness, mouthguard, sports dentistry

ÖZ

Amaç: Türk sporcuların ağızlık kullanımı hakkındaki farkındalıklarını incelemek ve ağızlık kullanımını rutin hale getirmek.
Yöntem: Bu kesitsel çalışma sporcuların ağızlık kullanımının avantajları hakkındaki bilgilerini belirlemeyi amaçlamaktadır. Tüm soruları yanıtlayan 18 yaş üstü katılımcılar bu çalışmaya dahil edildi. Ankete katılmayı reddedenler hariç tutuldu. 10 sorudan oluşan yüz yüze anket yapıldı. Anketler bir gün içinde verildi ve ertesi gün toplandı.
Bulgular: Koruma farkındalığı ile ağızlık kullanımı arasında anlamlı bir fark vardı (P<,05). 218 (%90,1) sporcu ağızlıkların farkındaydı ancak sadece 57 (%26,1) kişi kullanıyordu. Ayrıca ağız yaralanması olan sporcuları gören 141 (%58,2) sporcudan sadece 48 (%34) kişi ağızlık kullanıyordu. 120 (%49,5) sporcu spor yaralanmaları konusunda eğitim almış olmasına rağmen 76 (%63) katılımcı hala ağızlık kullanmıyordu. Konsantrasyon ve performansa zarar vermesi, nefes almada zorluk, eğitim eksikliği, ekonomik zorluklar, mide bulantısı gibi sebeplerden dolayı ağız koruyucu kullanmıyorlar. Bunların arasında en çok belirtilen sebep %44 ile performans ve konsantrasyonlarının azalacağı. Katılımcıların %72'si diğer branşlara göre en fazla temas ve dövüş sporlarının ağız koruyucu kullanması gerektiğini düşünüyor.
Sonuç: Bu çalışma Türk sporcuların ağız koruyucuların faydaları konusunda hemfikir olmalarına rağmen ağız koruyucular hakkında eğitimlerinin sınırlı olduğunu gösterdi. Türkiye'deki sporcularda ağız koruyucu kullanımı konusunda eğitim ve farkındalık teşvik edilmelidir.
Anahtar Kelimeler: Farkındalık, ağız koruyucu, spor diş hekimliği

INTRODUCTION

Sport can be defined as verbal, mental, cognitive and social development, in the form of a game, which do not comply with the rules. Dentistry and sports unite in the exciting practice of sports dentistry. Sports dentistry is a department of science which includes dentistry and sports by focusing on avoiding and curing orofacial injuries and related oral diseases.[1] The mean prevalence of dental and oral injuries reported in the literature ranges between 4% and 33%.[2] Previous epidemiologic surveys have reported 9% of young adults (18–19 years) involved in sport will experience a dental injury,[3,4] the incidence is 39% in children,[5] with an overall incidence rate of 27–30%.[6,7] Recently, the rate of dental trauma which is resulted from contact sports has raised. According to the results of studies, 31% of the reason of such trauma in adults

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is sports.[8] Athletes face with a dental injury while attending to sports at least once in their life.[9] Wearing a mouthguard can diminish the occurrence of orofacial injuries.[10,11] Athletic mouthguards are used to prohibit intraoral trauma in sports.[1,12] In 1962, the rate of facial and mouth injuries was reduced from 50% to 1.4% after compulsory use.[13] Morrow et al.[14] in a prospective study reported that the use of mouthguards reduced the injury rate from 30.3% to 2.8%. Cohenca et al.[9] stated that the rate of injuries to soccer players who have to use mouthguards is five times less than that of basketball players who do not require mouthguards.

The mouth guards defined as a "resilient device or appliance placed inside the mouth to reduce oral injuries, particularly to teeth and surrounding structures." It also can be seen as a gum shield or mouth protector.

The subsequence of orofacial injuries varies relying on the type of sport that is played, the degree of contact, and the age, gender and geographical location of the subject.[15]

The aim of this research is to determine the awareness of Turkish athletes about the mouthguards and their mouthguard usage routine.

METHODS

This cross-sectional study is aimed to determine the knowledge about the advantage of mouthguard use of athletes at Kırıkkale University. Participants over the age of 18 who answered all questions were included in this study. Those who refused to participate in the survey were excluded. A face-to-face survey including of 10 questions was made. The questionnaire were given on a day and collected the next day. Table 1 represents the questions of the athletes questionnaire which was developed from previous survey.[16]

Table 1. Questionnaire

Faculty:
Old:
1. At which sports branch(es) are you athlete?
2. How many year did you spend as an athlete?
3. Have you ever seen an athlete around you who had a mouth injury?
o Yes
o No
4. Do you believe that mouthguards protect from mouth injuries?
o Yes
o No
5. Do you think mouthguards affect the performance of athletes?
o Yes
o No
6. Are there any athletes that wear mouthguards around yourself?
o Yes
o No
7. In which sports do you think it is necessary to wear a mouthguard?
8. Is there any sort of education on sport injuries, orofacial injures and/or mouthguard usage in yourclub/school/institute?
o Yes
o No
9. Would you like to have more information about mouthguards and their types?
o Yes
o No
10. Write probable reasons of why athletes do not wear a mouthguard?

Approval of the study was obtained from the Kırıkkale University Clinical Research Ethics Committee (Reg. No:15/28 Date: 01.10.2018). This cross-sectional, descriptive study was carried out by the researchers of the Faculty of Dentistry, Kırıkkale University, Türkiye. Informed consent form was obtained from the participants.

Statistical Package for Social Sciences version 21 (IBM SPSS Corp., Armonk, NY, USA) were used for the data analysis. Frequency distributions were made for all variables. Statistical analysis was made by the Chi-square and Fisher exact test. Groups with significant degrees of difference were determined by post-hoc z-test with Bonferonni correction. Differences between the groups were assessed with a *P* value of 0.05.

RESULTS

In total, 242 athletes were participated in the current study. The participants were divided into three age groups: 18-20, 21-23 years and 24+ years. The age distributions of the participants are shown in Table 2. The distribution of sports branches that athletes are doing and the classification of these sports branches as contact or non-contact.

Table 2. Age distributions of participants

		Frequency	Percent	ValidPercent	CumulativePercent
Age Distrubation	18-20	85	35.1	35.1	35.1
	21-23	122	50.4	50.4	85.5
	24+	35	14.5	14.5	100.0
	Total	242	100.0	100.0	

The experience of the athletes ranged between 0 to 7 years with a mean experience of 2.,46 years. 30 participants did not answer the question of how many years of experience.

There was a significant difference between awareness of the protection of mouthguards and the use of mouthguards. Research results show that 218 (90.1%) athletes use mouthguards in total. However, it is seen that only 57 (26.1%) of these 218 athletes use mouthguards. In addition, although 141 (58.2%) athletes had suffered mouth injuries before, only 48 (34%) of them were using mouthguards. Among the athletes participating in the study, 120 (49.5%) people experienced sports injuries. Despite this, 76 (63%) of these athletes still do not use mouthguards ($P<.05$ for all comparisons; Table 3).

The answers given as reasons for do not use a mouthguard were as follows: difficulty in breathing, nausea, economic difficulty, negative effects on concentration and performance, lack of knowledge and other reasons. The frequency of these reasons is shown on the Table 4. The 44.2% of the athletes don't wear mouthguards, because they think that mouthguards influence their concentration, that's why their performance will decrease.

Table 3. Comparative distribution of the athletes' answer to the interview

	Are there any athletes that wear mouthguards around yourself?			
	Yes (%)	No (%)	Total (%)	P value
Have you ever seen an athlete around you who had a mouth injury?				
Yes	48 (68.6%)	93 (54.1%)	141 (58.2%)	0.044
No	22 (31.4%)	79 (45.9%)	101 (41.8%)	
Do you believe that mouthguards protect from mouth injuries?				0.008
Yes	57 (81.4%)	161 (93.6%)	218 (90.1%)	
No	13 (18.6%)	11 (6.4%)	24 (9.9%)	
Is there any training in your sports club about sport injuries?				
Yes	44 (62.9%)	76 (44.2%)	120 (49.5%)	0.011
No	26 (37.1%)	96 (55.8%)	122 (50.5%)	
Do you think mouthguards affect the performance of athletes?				
Yes	38 (54.3%)	61 (35.5%)	99 (40.9%)	0.009
No	32 (45.7%)	111 (64.5%)	143 (59.1%)	
In which sports do you think it is necessary to wear a mouthguard?				
Contact and fight sports	61 (87.1%)	113 (66.9%)	174(72%)	0.009
Team sports	2 (2.9%)	11 (6.5%)	13(5.3%)	
Outdoor sport	1 (1.4%)	15 (8.9%)	16(6.7%)	
All sports	6 (8.6%)	30 (17.8%)	36(15%)	

The P values obtained from the questionnaire show the difference between yes or no.

Table 4. Frequency table of reasons for not using mouthguards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Impedes Breathing	34	14.0	14.0	14.0
	Nausea	17	7.0	7.0	21.1
	Economic Difficulty	10	4.1	4.1	25.2
	Limits Performance	107	44.2	44.2	69.4
	Insufficient Information	32	13.2	13.2	82.6
	Other	42	17.4	17.4	100.0
	Total	242	100.0	100.0	

There were 143 (59.1%) athletes who think that mouthguards will not affect performance (*P*=.009). However, 111 (77.6%) of these 143 athletes do not use mouthguards. *P*<.05 for all comparisons; Table 3). In the answers given to the question of using mouthguards in sports branches, contact and fight sports had the highest score of 72% within all other sports branches. This difference was statistically significant.

As seen in Table 5, 56% of athletes believe that the use of mouth guards will reduce performance, even though they believe in the protection of mouth protectors. There is no relationship between believing in the protection of the mouthguards and the effects of performance (*P*<.05). This situation also coincides with the reasons for not using mouth protector in table 4.

Also, 81.8% of the participants stated their demands on the education about mouthguards and types (Table 6).

Table 5. Distribution of the athletes' answer to the interview

	Do you think that mouthguards influences that athletes' performance?		
	Yes	No	Total
Do you believe that mouthguards prevent oral injuries?			
YES	81[a]	137[b]	218
NO	18[a]	6[b]	24
Total	99	143	242

Table 6. Frequency of requesting information about mouthguards and their types

	YES	Frequency	Percent	Valid Percent	Cumulative Percent
Would you like to have more information about mouthguards and their types?		198	81.8	81.8	81.8

DISCUSSION

Sports are one of the reason for dental and orofacial injuries and dental accidents, which are are able to affect the whole lifetime. However, these effects can be prevented with sufficient level of education and preventive measures. Moutguards are one of the most important preventive measures that are especially affective in activities in which the risk of blows and falls are high.[19,20] Stenger et al.[21] stated that the number of dental injuries in football decreased to almost half (50%) with the introduction of face masks. The study also showed that this number reduced to 1,4% with the addition of mouthguards. Although according to the literature, injuries can occur at many sports most of participants thought that mouthguards should be used at contact and fighting sports.[17,18] This suggests that our participants do not have adequate information about the effective use of mouthguards. As a proof of this suggestion, 81.8% of the participants stated their demands on the education about mouthguards and types.

Mouthguards behave as a buffer by "moving the soft tissues in the oral cavity from the teeth preventing lacerations, bruising of lips, cheeks, and tongue during an impact."[22] To buffer the teeth from direct frontal blows during redustribution prevents tooth fractures or dislocation. Opposing teeth are preserved from seismic contact with each other.[23] Cushioning the teeth from direct frontal blows while redistributing the force of the blow over all the teeth is supposed to prevent tooth fractures or dislocations. According to many authors, mouthguards are an effective prevention mean for concussion and spinal injuries.[23]

In this study, the frequency of encountering orofacial injuries was 58.2%. This rate indicates that the prevalence of orofacial injury in present study is much higher than in studies in Brazil, Israel and Birmingham, England, where they were 28.8%, 27% and 12%, respectively. The prevalence may be higher due to the limited use of mouthguards.[3,24,25]

As a result of a study conducted in Israel, it was stated that the amount of orofacial injuries is critically higher in athletes who do not use mouth guards.[3] Although most of the current athletes do not use mouthguards, the knowledge and awareness of the mouthguard is similar to the findings of previous study.[24]

In this study, 90% believed that mouthguards would be protective against mouth injuries. The reported rates of such awareness in other countries were 100% in Germany and Switzerland, 81.9% in Japan, 52.4% in Brazil, 27% in Israel, 82.8% in Nigeria, 44.1% in Turkey.[3,25-28] The results of our study were found to be similar to most of the previous studies. The findings of the current study showed that the majority of Turkish athletes agree on the protective effects of mouthguards against orofacial injuries, but do not try to encourage them to use mouthguards.

Of the athletes participating in this study, 218 (90.1%) were aware of mouth protectors, but only 57 (26.1%) were mouthguards. Despite the fact that the awareness rate is so high, the low use rate suggests that participants should have a reason for not using mouthguards.The reasons stated for not wearing mouthguards varied and were largely identical with other surveys.[16,18] Table 4 gives the ratios of the possible causes of non-use of mouthguards. The most popular response (44.2%) is that they break down the concentration, so they think their performance would fall but, some research suggested that mouthpieces might enhance performance.[29]

It has been shown that the use of suitable mouth guards in professional football players causes an increase in arm strength compared to unsuitable ones because of the change in bite patterns with mouthguards. Recently, the research claimed that mandibular position and oral appliances influence the upper body strength, endurance, improvement after athletic competition, concentration and stress response in a positive way.[25] Many studies have reported that mouth protectors can not only protect teeth, but also improve sport performance.[30,31] It has also been confirmed by laboratory tests that mouthguards have positive effects on exercise performance.[32,33] In another study, it was confirmed that there is no negative performance effect on using a mouthguard, especially in sports with a high risk of dental injury.[34,35] In particular, it is necessary to draw attention to the importance of controlling post-traumatic stress in athletes who have experienced trauma in terms of physical performance, because fear, uncertainty, and intimidation occur after trauma and this can affect performance during sports practice.[29] From the responses of the athletes who took part in this survey, it can be seen that Turkish athletes have the misconception that the use of a mouthguard has reduced their performance, or that they do not have much information about mouthguards.

One of the possible reasons for not using mouthguards is that they think they make it difficult to breathe. In a study by Collares and colleagues, futsal players rated maximum oxygen uptake in a 20-meter shuttle. There was no significant difference in VO_2 max (maximal oxygen uptake) between those who did wear a mouth protector and those who did not.[17] There are other studies showing that the use of mouthguards does not affect the VO_2 max.[35] Garner et al. [31] have proven that different types of mouthguards raise airway clearance and improve lactate levels.

In our study, most of the participants think that athletes who play contact and combat sports should use mouthguards. However, athletes may experience mouth injury in all sports. There are many studies that show that using mouthguards in team sports such as football and basketball prevents injuries to the mouth.[17,18] This result does not support the prejudice of the Turkish athletes about the negative effects on their performance. We think that Turkish athletes need more training on mouth protectors. And we want to encourage the athletes to use mouthguards.

The major limitations of this study are that it only included one center and the lack of the power analysis and pilot study.

CONCLUSION

This study showed that Turkish athletes had limited knowledge of mouthguards. Also, providing more education about mouthguards to athletes will increase the usage of mouthguards during sports activities, and thus injuries will decrease in our country.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Kırıkkale University (Date: 01.10.2018, Number: 15/28).

Informed Consent: Informed consent form was obtained from the participants.

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