

Awareness and Utilization of Mouthguards – An Overview

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Abstract

The aim of this review is to highlight the awareness and utilization of mouthguards and reasons for not wearing it. A literature search was performed using the PubMed, Web of Science, Scopus and Google scholar data base for all the articles between 2000 and 2018 and was not restricted to specific languages. The search terms used were mouth guard, mouth piece, mouth protector, awareness and use. The results revealed that the awareness of mouthguards is high but the usage is low. In most of the studies the given reason for not using mouthguards is not necessary to wear it followed by discomfort.

Keywords: Awareness, Mouthguard, Use.

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INTRODUCTION

Traumatic dental injuries (TDIs) occur often in children and young adults, comprising 5% of all injuries. According to the literature, it is estimated that 71-92% of all TDIs sustained in a lifetime occur before the age of 19 years [1]. Vigorous physical activities offer a variety of benefits for children [2], but they also place participants at increased risk for dental injury [3]. Sports-related incidents account for 10% to 38% of all childhood dental injuries [4].

The risk of injuries has been shown to increase with age of the athletes and higher in children who participate regularly with increased number of hours in sports [5]. Use of mouthguards has been shown to decrease the risk of sustaining injuries to the facial hard and soft tissues by providing a resilient, protective surface to distribute and dissipate transmitted forces on impact [6].

Levin *et al.*, [5] reported that 27% of study participants were knowledgeable of the need for mouth guards, but only 3% actually used them. According to a study by Aljohani *et al.*, [7] in Saudi arabia, the most frequently reported barriers to using a mouthguard during practice were difficulty in practicing with it, not being convinced of its importance and lack of

knowledge of where to get one. In a study by Al-arfaj *et al.*, [8] in Saudi arabia, only 33.9% reported using mouth guards. These studies emphasize the need for educational campaigns about the role of a mouth guard in preventing orofacial trauma among sports participants. This paper reviews the literature relating to awareness and utilization of mouth guards to prevent sports injuries.

AIM

The aim of this review is to highlight the awareness and utilization of mouthguards and reasons for not wearing mouthguards.

METHODS

A literature search was performed using the PubMed, Web of Science, Scopus and Google scholar data base for all the articles between 2000 and 2018 and was not restricted to specific languages. The search terms used were mouth guard, mouth piece, mouth protector, awareness and use. The search was further limited by restrictions to humans, and studies with full article. All the articles were reviewed by both the authors. No formal quality assessment or selection criteria were employed.

Mouthguards – Awareness and Utilization:

Author	Year	Participants	Methods	Awareness of Mouth guard	Mouthguard use	Reason for not wearing Mouthguard
Ferrari CH, De Medeiros JM.	2002	1029 Males	The questionnaire consisted of the following items: name, age, period of time the athlete had been practicing the sport; period of time practicing other sport modality; the occurrence of any dental trauma while practicing the respective sport modality; regular use of mouthguard; athlete's level of awareness concerning the need of using mouthguard while training, playing and competing.	52.4%	15.9%	Is not necessary
Pribble JM et al	2004	120	The survey consisted of 34 questions. There was one open ended question regarding parental perceived barriers to mouthguard use in competitive youth soccer.	90%	14%	Disturbing/uncomfortable (42%) Impaired breathing (17%) Is not necessary (15%)
Lieger O, Von Arx T.	2006	267 Players, 63 Officials	The surveys consisted of 21 questions for the athletes and 10 questions for the officials.	59%	16%	Impaired breathing (29%)
Ma W	2008	236 Males	The questionnaire contained five demographic questions including the following items: age, height, weight, education, and the time of basketball training. There were eight multiple choice questions dealing with the knowledge and attitude toward mouthguards, the evaluation of the dental injury risk in basketball, and the awareness of dental injury prevention.	80.1%	0.4%	Is not necessary (28.4 %) Disturbing/uncomfortable (26.7%) Too expensive (13.6%)
Rayner W	2008	112	Data collection was by means of self-completed postal	100%	75%	Is not necessary (58.2 %) Disturbing/uncomfortable (23.9 %)

			questionnaires.			
Hersberger S et al	2012	355 Male & 60 Female	The interview contained 15 questions about general, facial and dental injuries experienced, tooth replantation, tooth rescue boxes and mouthguards	41.7%	7.7%	Is not necessary (40.7%)
Lee JW et al	2013	109 Males & 43 Females	The survey questionnaire consisted of three sections, mouthguard awareness (3 questions), reasons for not wearing mouthguard (10 questions) and the last section to test the level of acceptance on current mouthguard and when the identified problems rectified (2 questions)	17.7%	44.4%	Impaired breathing (43.4%)
Abdullah D et al	2013	154 Male & 71 Female	The questionnaire consisting of demographic data such as age, gender, type of sporting activities, total hours dedicated to sport training, level of sport representation, awareness of risk of dental injuries, knowledge on mouthguards such as definition of a mouthguard, role of mouthguards, use of mouthguards and reasons for not wearing mouthguards and experience in sustaining dental injuries during sports activities.	46%	37.3%	Is not necessary (0.70%) Does not look good (4.30%)
Tiwari V et al	2014	213 Males & 107 Females	Information on demographic characteristics and oral health behaviors, such as history of soft or hard tissue injury and mouthguard use, was collected by means of a personal interview administered by the examiner. Each athlete received a thorough interview followed by a type III clinical examination.	50%	23.9%	Impaired breathing (6.5%) Impaired talking (2.2%) Is not necessary (31%) Does not look good (9.5%)

Leone D et al	2014	231	Questionnaire was used to collect the data.	93.9%	78.7%	interference of performance during sports practice
Uzel I et al	2014	343 Males	Data was obtained from personal and direct interview, through questionnaires answered by four teams' licensed amateur soccer players in İzmir city's clubs.	38.2%	0.29%	Impaired breathing (1.7%) Impaired talking (4.4%) Is not necessary (31.48%)
Sethi HS et al	2016	1147 Males & 853 Females	Children were questioned about their perceptions regarding the protective role of mouthguards and the reasons behind not using mouthguards.	78%	4.25%	Is not necessary (17.91%) Too expensive (10.81%)
Al-Arfaj I et al	2016	124	The questionnaire contained questions about personal background (age, education, type of sport, and duration of involvement), history of sports-related dental trauma and participant's attitude toward sports-related trauma and the actual use of a mouth guard.	27%	33.9%	Is not necessary
Kroon J et al	2016	494 Male Players 32 Coaches	Data were collected anonymously during training sessions by means of a survey questionnaire, followed by a presentation on mouthguards and the management of TDIs.	93.7%	68.2%	Is not necessary (35.7%) Too expensive (40.1%)
Aljohani YR et al	2017	68 Males	Online questionnaire about the incidence and awareness of OMF injuries and their prevention was developed and distributed to taekwondo athletes in Saudi Arabia via their coaches.	81%	56%	Is not necessary (38.7%) Disturbing/uncomfortable (29.0%)
Galic T et al	2018	157 Males & 72 Females	A standardized questionnaire about the frequency of orofacial and dental injuries was used. Questions were also asked about athletes' habits related to mouthguard use.	97.3%	41%	Impaired breathing (3.1%) Is not necessary (21.8%) Disturbing/uncomfortable (12.70%)

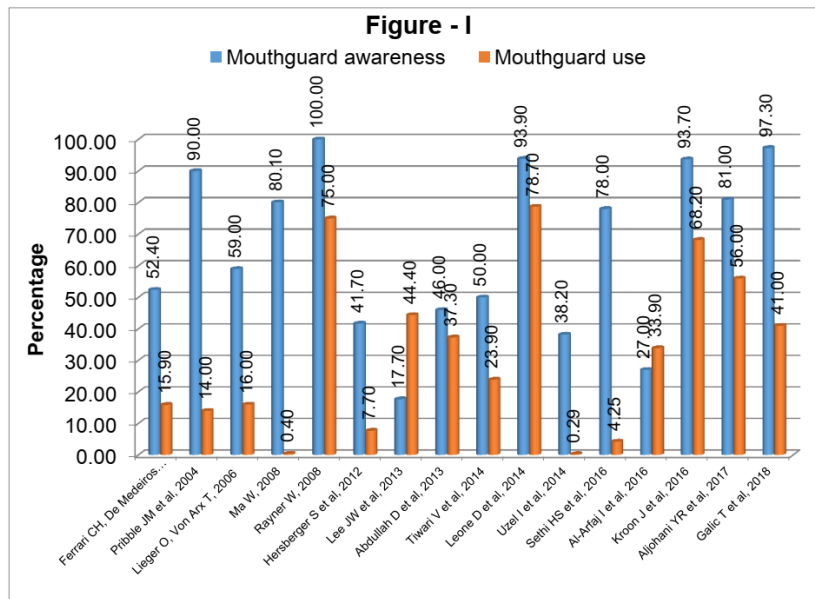
RESULTS

Table-1: Studies showing percentage of mouthguard awareness and usage

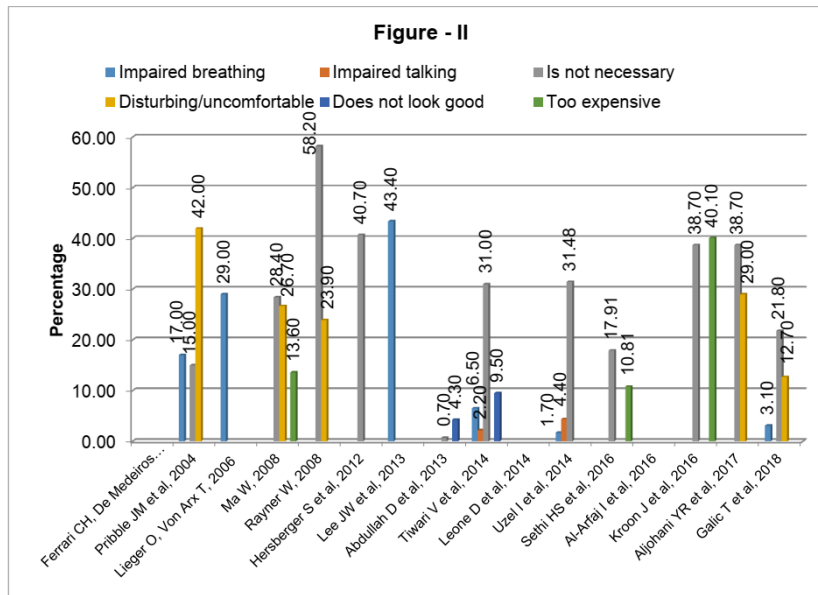
Author, Year of study	Mouthguard awareness	Mouthguard use
Ferrari CH, De Medeiros JM, 2002	52.40%	15.90%
Pribble JM <i>et al.</i> , 2004	90.00%	14.00%
Lieger O, Von Arx T, 2006	59.00%	16.00%
Ma W, 2008	80.10%	0.40%
Rayner W, 2008	100.00%	75.00%
Hersberger S <i>et al.</i> , 2012	41.70%	7.70%
Lee JW <i>et al.</i> , 2013	17.70%	44.40%
Abdullah D <i>et al.</i> , 2013	46.00%	37.30%
Tiwari V <i>et al.</i> , 2014	50.00%	23.90%
Leone D <i>et al.</i> , 2014	93.90%	78.70%
Uzel I <i>et al.</i> , 2014	38.20%	0.29%
Sethi HS <i>et al.</i> , 2016	78.00%	4.25%
Al-Arfaj I <i>et al.</i> , 2016	27.00%	33.90%
Kroon J <i>et al.</i> , 2016	93.70%	68.20%
Aljohani YR <i>et al.</i> , 2017	81.00%	56.00%
Galic T <i>et al.</i> , 2018	97.30%	41.00%

Table-2: Various studies showing percentage of different reasons for not using mouthguards

Author, Year of study	Reason for not wearing mouthguard					
	Impaired breathing	Impaired talking	Is not necessary	Disturbing/uncomfortable	Does not look good	Too expensive
Ferrari CH, De Medeiros JM, 2002			Yes			
Pribble JM <i>et al.</i> , 2004	17%		15%	42%		
Lieger O, Von Arx T, 2006	29%					
Ma W, 2008			28.40%	26.70%		13.60%
Rayner W, 2008			58.20%	23.90%		
Hersberger S <i>et al.</i> , 2012			40.70%			
Lee JW <i>et al.</i> , 2013	43.40%					
Abdullah D <i>et al.</i> , 2013			0.70%		4.30%	
Tiwari V <i>et al.</i> , 2014	6.50%	2.20%	31%		9.50%	
Leone D <i>et al.</i> , 2014				Yes		
Uzel I <i>et al.</i> , 2014	1.70%	4.40%	31.48%			
Sethi HS <i>et al.</i> , 2016			17.91%			10.81%
Al-Arfaj I <i>et al.</i> , 2016			Yes			
Kroon J <i>et al.</i> , 2016			35.70%			40.10%
Aljohani YR <i>et al.</i> , 2017			38.70%	29%		
Galic T <i>et al.</i> , 2018	3.10%		21.80%	12.70%		



Graph-1: Graph showing percentage of mouthguard awareness and use in various studies



Graph-2: Graph showing percentage of different reasons for not using mouthguards in various studies.

The studies from 2002 to 2018 revealed that the awareness of mouthguards is high but the usage is low. In most of the studies the given reason for not using mouthguards is not necessary to wear it followed by discomfort. Table-1 and Graph-1 showing that the percentage of mouthguard awareness and use in various studies. Table-2 and Graph-2 depicts various studies showing percentage of different reasons for not using mouthguards.

DISCUSSION

In children, sports accidents reportedly account for 10–39% of all dental injuries. Boys are more likely than girls to incur injuries; at a ratio of 1.5–3.1

A mouthguard is defined as ‘a resilient device or appliance placed inside the mouth to reduce oral injuries, particularly to teeth and surrounding structures [6]. First introduced by boxers in the 1920s and 1930s, mouthguards were soon used by gridiron footballers, primarily as a result of the pioneering work of a number of American dentists including Cohen & Borish [9] and Cathcart [10], the former demonstrating that, ‘the wearing of a properly fitted mouthguard all but eliminated mouth injuries in high-school footballers’. Mouthguards are not just effective in the prevention of dento-alveolar injuries but also prevents concussion injuries.

There are three main types of mouthguard: Pre-fabricated or stock mouth guard, Mouth-formed

mouth guard and Custom-made mouth guard. Most of the studies showed that the percentage of utilization of mouthguard is less even though the percentage of awareness is more. According to literature the awareness is more among coaches and players compared to participants who are not involved regularly in contact sports.

A considerable number of papers have appeared in the dental literature highlighting the reason for not using mouthguards is not necessary to wear it. The next given reason for not using mouthguard is due to disturbance or discomfort. The participants in two studies mentioned that mouthguard impairs breathing. According to Ma *et al.*, [11], Sethi *et al.*, [12] and Kroon J *et al.*, [13], the reason for not using mouthguard is it is too expensive. Few participants in only two studies considered that it impairs talking and it is esthetically unacceptable to wear. In the literature, the children were educated about mouth guards by coaches and team members, it is perhaps surprising to find that creating awareness by dentist is poor.

According to the literature, athletes who don't wear mouthguards are 60 times more likely to damage their dentition. Often times these injuries will result in permanent damage to oral structures which require medical intervention. Not only do mouthguards save teeth, they help protect jaws and can also prevent traumatic injuries such as concussions. Children, who participate in soccer, rugby, football, basketball, hockey, baseball, and lacrosse are typically the most affected by lost or damaged teeth. Children who are involved in non-contact sports like mountain biking, climbing or skateboarding can also benefit from wearing a mouthguard.

It is important to remember that the damaged teeth do not grow back. The percentage of children using mouth guards is poor despite having awareness of mouth guards to protect their teeth from orofacial injuries. Our literature review focused only on awareness, utilization and reason for not wearing mouth guards. Hence further studies are required to review the role of mouth guards and its effectiveness in prevention of sports-related dental injuries.

CONCLUSION

- It is clear that the literature views mouthguards as an effective device to prevent injuries.
- The percentage of children using mouthguards is poor despite having awareness of mouth guards to protect their teeth from orofacial injuries.
- Educational campaigns with involvement of dental practitioners to create awareness and use of mouth guards and the management of TDIs should be ongoing for children, youth and their parents.

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