

Sports-Related Dental Injury from the Perspective of Malaysian Athletes

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Abstract

This study aimed was to evaluate the prevalence of sports-related dental injury among athletes as well as assessing athletes' knowledge and the utilization of mouthguards as a preventive measure.

In this cross-sectional study, Malaysian athletes from various sports were recruited in a survey by convenient random sampling. Information on the subject's demography, self-reported dental injury, knowledge and awareness of mouthguards as well as the availability of a dental team were elicited in the questionnaire.

A total of 254 athletes (61% male, 39% female) participated in the survey where 83.9% (n=213) from contact sports. The prevalence of self-reported dental injury was 51.18% (n=130). The most common form of injury reported was bruised face (11.4%) followed by lacerated lip (10.6%) and crown tooth fracture (10.6%). Significantly higher incidence dental injury was reported by male athletes (p=0.013) and significantly associated with contact sports (p<0.001). Half of the athletes were in a moderate knowledge level and were statistically significant in contact sports (p=0.015). Although most athletes (n=201, 79.1%) were acknowledged the importance of mouthguards during sports participation, only 47.63% (n=121) utilized it.

The prevalence of self-reported dental trauma among Malaysian athletes is high. The most common reported injuries were soft tissue trauma and crown tooth fracture. There is a need for education among Malaysian athletes in dental injury prevention where utilization of mouthguards should be intensified in practice.

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Introduction

Traumatic dental injury is the most common orofacial injuries related to contact and non-contact sports and often leads to esthetic, functional and detrimental psychological problems.¹ As the popularity and the participation in contact sport grows, the risk of traumatic dental injury increases. This is further complicated by greater interest and

encouragement for participation at pediatric age.^{2,3} Although the rate of injury is low compared to other anatomic regions, dental injury poses long term functional, social, psychological and financial detriments.⁴ An injury can be so severe to force withdrawal from participation and prolong athletes' downtime. It is more commonly reported in sports such as mountain biking, roller skate, skateboard and aggressive contact sports. Among ball sports, sepak takraw recorded the highest injury reported.⁵ A study by Ferrari and De Medeiros⁶ showed the predominance of dental trauma in different types of sports including jiu-jitsu with 41.2%, handball with 37.1%, basketball with 36.4%, soccer with 23.2%, judo with 22.3% and field hockey with 11.5%.

Orofacial trauma such as soft tissue injuries, facial bone fractures, temporomandibular joint injuries and tooth intrusion are among common

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during contact sports.^{7,8,9} In such sports, the facial area is exposed to injuries from a collision with other players in addition to fast movements and nature of the sports.⁸ In non-contact sports especially object-based sports, direct trauma from impacting force of an object such as a ball at close range was identified as a mechanism of injury. Alternatively, the injury from direct trauma of the impacting force of a ball at close range is also conducive for dental injury.¹⁰ Cohenca et al⁷ attempted to classify various tooth injuries ranging from simple fractures to tooth avulsion. The study also reported that crown fractures were the most dominant class of injury. High prevalence of dental trauma and its impact in daily life is considered a major public oral health problem.¹ The prevalence and severity of sports-related dental injuries vary, with an estimate between 0.2% to 33.5%, although it might be underreported.¹ Previous study revealed that most of the athletes have at one point in their athletic career experienced dental injuries either during training or competition.^{8,10,11} To this date, the knowledge of sports enthusiasts on prevention and prompt protocol following dental injuries was generally known to be deficient.¹¹

Utilization of appropriate protection in sports such as mouthguards or helmet are encouraged to protect facial structures, teeth and oral soft tissues, and even skulls.^{6,10} Protective masks used after facial fractures should be custom made type to protect and prevent recurrence during healing. Such shield dissipates stress and forces from impacting surrounding tissues and supporting structures.¹² Nasal bone is the most affected hard-tissue structure since it is located on a prominently vulnerable area of the face with a more forward projection. In cyclists, the zygomatic fracture (30.8%) is the most prevalent and followed by temporomandibular fracture (18.8%).¹³ Again, it is imperative to utilize preventive measures in high impact or contact sports in order to reduce the risk of trauma traumas that can jeopardize the career of an athlete. A mouthguard is an appliance that covers teeth and surrounding mucosa with the aim to prevent and reduce trauma to the orofacial tissue structure.^{6,14} The efficacy of athletic mouthguards for the prevention of dental trauma is documented in the sport that mandates their use.¹¹

By wearing protective gear, injuries such as concussions and many others can be reduced.

However, most athletes neglect the usage of any protective gear needed for their oral or dental health during sports participation.¹⁵⁻¹⁸ Despite the ability to decrease the frequency of dental injury, factors such as availability, knowledge, cost and attitudes factors have been demonstrated to influence whether or not the patient is compliant. A systematic review reported that non-users of mouthguards had significantly more orofacial injuries than those who used them.¹⁷ Daneshvar et al¹² showed that by wearing protective gear the number of dental injuries and concussions is reduced, all of these are also supported by previous studies.^{15,18} Appropriate emergency response following trauma prevention may facilitate tooth preservation and minimize follow-up costs.⁸ It is important for athletes and sports teams to be aware of how to respond to dental trauma so that a positive outcome is assured. Specific educational preventive programs are needed despite the level of educational attainment among athletes as an increasing number of dental sports injuries are exhibited.⁸

This research was to elucidate the experience, knowledge and practices concerning sports-related dental injury among contact and non-contact sports participants in Malaysia. Another aim was to assess the awareness of protective gear utilization and associating factors. It is our hope that this study information would aid in a way of imparting health education by increasing the awareness and information on the risk of injury and the availability of mouthguards.

Materials and methods

A cross-sectional descriptive study was designed to address the objectives and was carried out from June 2018 until April 2019. National athletes from Universiti Teknologi MARA (UiTM) campus in Selangor and competitive athletes at national or international tournaments held in Selangor, Malaysia were approached randomly. Athletes recruited were aged 12 years and above and active in any kind of sport. The request for participation was made verbally to the eligible athletes and the objective of the study was explained and included in the questionnaire form. Written consent was obtained from the athletes or their respective guardians for those who were under-aged prior to participation. This study was conducted in accordance with the ICH Good Clinical Practice, Malaysian Clinical

Practice Guidelines and the Declaration of Helsinki and approved by the Research and Ethics Committee, Universiti Teknologi MARA, Malaysia (REC/301/18).

The self-administered questionnaire that was developed based on previous studies done by Tin-Oo MM and Razali R,⁵ Correa MB et al,¹⁹ Rouhani A et al²⁰ and Liew AK et al²¹. The questions were collected, edited and modified then translated into Malay by five establish an expert committee that familiar with the subject of sports-related dental trauma. To assist in the interpretation of the medical terminology, translation used was practiced in a daily language. Preliminary pilot testing was performed on 20 amateur athletes. Their responses were not included in the data analysis however, suggestions from participants were considered for modification and rewording done accordingly. The questionnaires consist of 24 items that were divided into five parts: (A) demographic information, (B) the history and experience of any kind of sports-related dental injury, (C) the knowledge of management of sports dental injuries, (D) the awareness of the usage of protective gear and (E) the existence of dental team within the sports health group. The questionnaire was printed in English with Malay translation, the national language of Malaysia. The questionnaire was managed anonymously, and the numbering code is used. All participant was informed that the information given was confidential.

With reference to previous studies, sample calculation was performed using Epi Info for Windows version 7.2.1 with α set to 0.05 and confidence interval set to 95% and 314 participants with consideration of 5% dropout was decided.^{4,5,18-20} Athletes were required to complete the questionnaire within 5-10 minutes and collected after completion. Each question was either followed by yes or no answer (n=8) and the most plausible answer for the multiple-choice category (n=9). In the Part C, the level of knowledge in the management of sports-related dental injury was graded as low (<2 of total score), moderate (2.5-4) or high (>4.5).

Statistical analyses

All data collected were analyzed using the Statistical Package for Social Science (SPSS) for Windows (Version 23.0, Incorporated USA). Means and standard deviations for descriptive analysis were presented for gender, age, name

of sport played and category of sport. Other related data from self-reported dental injury, knowledge and management of sports-related dental injury and awareness regarding mouthguards were expressed in frequency and percentages. Two sides Pearson's Chi-square test was used to evaluate the categorical variables. The level of significance was set at $p=0.05$.

Results

A total of 254 athletes completed and returned the questionnaires with a response rate of 80.9% (n=254/314). The respondents constitute of 61.0% male (n=155) and 39.0% female (n=99). Athletes were aged between 15 and 39 years with the mean age was 22.73 years \pm 4.914. The age range is between 20-24 years old which were 47.6% (n=121) participants. They were categorized into contact sports (n=213, 83.9%) and non-contact (n:41, 16%). Most respondents were rugby athletes (n=126,49.6%). Out of the 254 participants, 97.6% were Malay (n=248).

Based on the responses, 51.2% (n=130) reported to have experienced orofacial trauma while playing sports. Among the respondents involved were from rugby (26.8%), football (6.7%) and hockey (6.3%). Mostly experienced bruised face, lip laceration and tooth crown fracture making up to 32.6% (Figure 1). Table 1 shows a summary of the distribution of experience of orofacial trauma in relation to gender and the category of sports. The injury experienced was significantly associated with male athletes ($p=0.013$) and contact sports athletes ($p<0.001$).

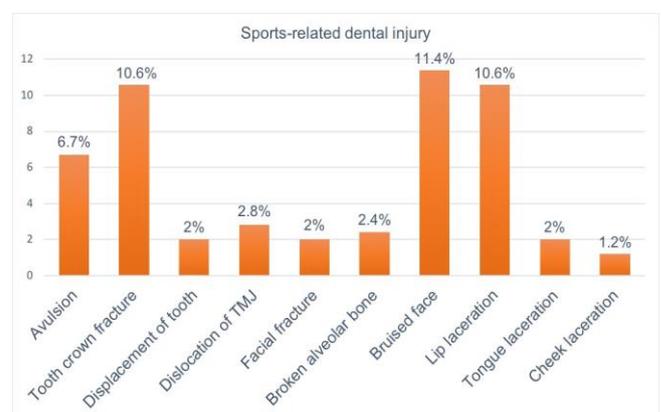


Figure 1. Distribution of self-reported dental injury in percentages.

	Experience of orofacial trauma (N=254)		X ² (df)	p-value
	Yes (n=130)	No (n=124)		
Gender				
Male	89 (35.03%)*	66 (26.0%)	6.194 (1)	0.013*
Female	41 (16.14%)	58 (22.83%)		
Category of sports				
Contact	121 (47.64%)*	92 (36.22%)	16.718 (1)	0.000*
Non-contact	9 (3.54%)	32 (12.6%)		

Table 1. Analysis of the self-reported orofacial trauma experienced by athletes and association with gender and the category of sports.

All data are shown as whole numbers and percentages.
 *p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

Variables	Category of sports (N=254)		X ² (df)	p-value
	Contact (n=213)	Non-contact (n=41)		
What action did you take after encountering any injury?				
Nothing	87 (34.3%)	12 (4.7%)	1.937 (1)	0.164
When to clinic/hospital	126 (59.2%)	29 (11.4%)		
When was treatment sought after injury				
On the day of accident	81 (31.9%)	23 (9.1%)	5.602(3)	0.133
1-7 days after accident	48 (18.9%)	7 (2.8%)		
Within the 1 st month	20 (7.9%)	1 (0.4%)		
When pain was felt on the injured site	64 (25.2%)	10 (3.9%)		
Do you know that avulsed tooth can be replanted?				
Yes	143 (56.1%)	23 (9.1%)	1.850(1)	0.174
No	70 (27.6%)	18 (7.1%)		
Knowledge on the duration which the tooth must be replanted				
Within 20 minutes	19 (7.5%)	2 (0.8%)	8.864(6)	0.181
Within 1 hour	26 (10.2%)	6 (2.4%)		
Within 2 hours	8 (3.15 %)	5 (2.0%)		
Within 6 hours	13 (5.1%)	3 (1.2%)		
Within 12 hours	12 (4.7%)	1 (0.4%)		
Within 24 hours	6 (2.4%)	3 (1.2%)		
I don't know	129 (50.8%)	21(8.3%)		
Are you know immediate action is essential for successful outcome for avulsed tooth				
Yes	144 (56.7%)	29 (11.4%)	0.155(1)	0.694
No	69 (27.2%)	12 (4.7%)		

Table 2. Part of the self-reported knowledge of athletes in the management of sports-related dental injury.

All data are shown as numbers and percentages.
 *p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

	Level of knowledge (N=254)			X ² (df)	p-value
	Low (n=99)	Moderate Level (n=125)	High (n=30)		
Category of sports					
Contact	90 (35.4%)	102 (40.2%)*	21 (8.3%)	8.363(2)	0.015*
Non-contact	9 (3.5%)	23 (9.1%)	9 (3.5%)		

Table 3. The level of knowledge of athletes in the management of sports-related dental injury.

All data are shown as whole numbers and percentages.
 *p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

Respondents were asked on what action did they take after encountering the injury and

61% (n=155) answered "went to dental clinic or hospitals following trauma" while 39% (n=99) answered "nothing". The level of knowledge regarding the management of dental trauma was detailed in Table 2 and Table 3. Out of 254 athletes, 49.3% (n=125) were in the moderate knowledge level and statistically significant with contact sports (p=0.015). Most of the respondents 65.4% (n=166) were aware that avulsed tooth can be replanted while 34.6% (n=88) are not. Although 68.1% (n=173) of respondents know that immediate action is required for a successful outcome but only 8.3% (n=21) know that avulsed teeth need to be replanted within 20 minutes while 59.1% (n=150) did not know the possibility of such treatment.

	Type of mouthguards(N=254)			X ² (df)	p-value
	Ready-made (n=94)	Custom-made (n=27)	Non-user (n=133)		
Gender					
Female	52 (20.5%)	11 (4.3%)	36 (14.2%)	18.521(2)	0.000*
Male	42 (16.5%)	16 (6.3%)	97 (38.2%)*		
Category of sports					
Contact	88 (34.7%)	23 (9.1%)	102 (40.2%)*	11.695(2)	0.003*
Non-contact	6 (2.4%)	4 (1.6%)	31 (12.2%)		
Experience of orofacial trauma					
Yes	43 (16.9%)	14 (5.5%)	73 (28.7%)	1.848(2)	0.397
No	51 (20.1%)	13 (5.1%)	60 (23.6%)		

Table 4. Analysis of the type of mouthguard usage and association with the category of sports and the experience of orofacial trauma.

All data are shown as whole numbers and percentages.
 *p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

Reasons	Category of sports (N=126)		Total	X ² (df)	p-value
	Contact (n=97)	Non-contact (n=29)			
Too expensive	11 (8.7%)	4 (3.2%)	15 (11.9%)	8.355(9)	0.499
Disturb speech	21(16.8%)	3(2.4%)	24 (19.1%)		
Disturb breathing	10(7.9%)	1(0.8%)	11 (8.7%)		
Discomfort	12(9.5%)	7(5.6%)	19 (15.1%)		
Nausea	4(3.2%)	2(1.6%)	6 (4.8%)		
Hurts teeth	4(3.2%)	0(0.0%)	4 (3.2%)		
Too tight	2(1.6%)	0(0.0%)	2 (1.6%)		
Do not own	17(13.5%)	4(3.2%)	21 (16.7%)		
Not necessary	11 (8.7%)	6 (4.8%)	17 (13.5%)		
Don't know about mouthguards	5 (4%)	2 (1.6%)	7 (5.6%)		

Table 5. Analysis of the reason for not using mouthguards.

All data are presented as whole numbers and percentages.
 *p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

The majority of athletes 90.2% (n=229) acknowledged the importance of protective gear in sports activities and 79.1% (n=201) were

familiar with mouthguards followed by face shield with 14.2% (n=36). Of the 47.4% (n=121) respondents stated that they own a mouthguard, 73% used ready-made type (n=94; stock n=48 and boil and bite n=46) (Figure 2). As shown by Table 4, the majority respondent did not wear any mouthguards and it was significant with male athletes ($p < 0.001$) and contact sports athletes ($p = 0.003$). However, the result showed no significant with the incidence of dental injuries ($p = 0.397$). Nonetheless, 49.6% (n=126) provided their reason for not using the mouthguard as in Table 5. Disturbed speech (n=24, 19.1%) and discomfort (n=19, 15.1%) were cited as the main reasons for not wearing the mouthguard, although the difference was not statistically significant ($p = 0.499$).

Only 24.4% (n=62) respondents stated that there is a dental team in their supporting health department. Table 6 shows the association with the experience of self-reported dental injury and type of mouthguards used.

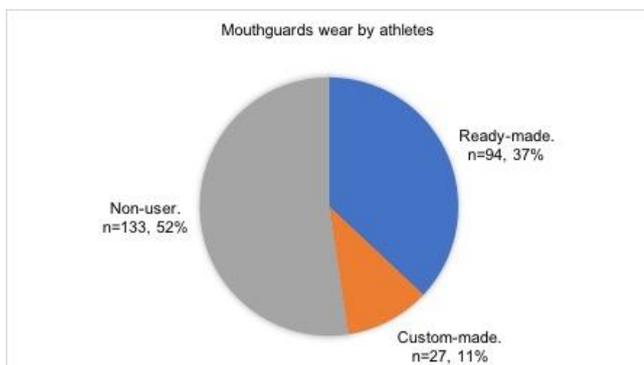


Figure 2. Type of mouthguard wear by Malaysian athletes in numbers and percentages.

	Availability of the dental team (N=254)		X ² (df)	p-value
	Yes (n=62)	No (n=192)		
Experience of orofacial trauma				
Yes	15 (5.9%)	115 (45.3%)*	19.906(1)	0.000*
No	47 (18.5%)	77 (30.3%)		
Type of mouthguards				
Ready-made	16 (6.3%)	78 (30.7%)	7.833 (2)	0.020*
Custom-made	4 (1.57%)	23 (9.1%)		
Non-user	42 (16.5%)	91 (35.8%)*		

Table 6. Analysis of the availability of the dental team and association with the experience of orofacial trauma and the utilization of mouthguards.

All data are presented as whole numbers and percentages.

*p-value < 0.05 is statistically significant; Pearson's Chi-square test (X²).

Discussion

The research carried out a random convenience sampling technique so that all athletes had an equal and independent chance of being selected as the population members who conveniently available to participate in the study. The response and the interest of the survey were very good to indicate the conclusion of dental injuries is a known risk in athletes in Malaysia. In the present study, the prevalence of orofacial injuries during sports activities was 47.6% in contact sports players and 3.6% in non-contact sports players.²¹

The prevalence of sports-related dental trauma reported by participants was similar to Abdullah D et al¹ and Rouhani A et al²⁰. The injuries occurred more frequently in vigorous sports activities such as rugby (49.6%), football (26.1%) and hockey (7.5%). Similar findings were reported among university athletes in Malaysia in 2013 where 40% of the athletes claimed to have sustained dental injuries while playing.^{1,21} Most players were experiencing orofacial trauma during their time involved in contact sport activity especially rugby.²² Soft tissue injuries to the orofacial are such as lip laceration, cheek laceration and tongue laceration being the most frequently reported injury in the study. Additionally, another study involving 40% of Scotland rugby union players recorded a high prevalence of soft tissue injuries requiring sutures.²³ These findings confirm the high prevalence of orofacial injuries associated with rugby, which is most likely due to the high contact nature of the sports. Most of our respondents sustained bruised face (11.4%) lip laceration ties with tooth crown fracture (10.6%) and avulsion (6.7%). These injuries were not verified by examining their mouth individually. Besides soft tissue trauma, the large number of injuries was crown tooth fracture, which has also been seen in Brazilian¹⁹ and Scottish²³ sports participants. Teeth in the maxillary anterior region were the most commonly injured teeth, a trend that correlates with findings from previously published studies.²²

Many studies reported the orofacial injuries occurred regularly and conclude that athletes in sport carry a considerable risk of injury.^{1,6,12} However, this result is different when compared to the studies that have been conducted in Brazil⁶ and Turkey²⁵, where the

prevalence of orofacial injuries was 12% and 10.2% respectively. The reason for the difference might have been correlated with limited use of protective gears among our respondents which only 49.6% reported ever worn any.²⁶

The present study revealed that almost half of the athletes have moderate knowledge in managing dental injury. According to this result, factors contribute to this were athletes who in direct contact sports and had experienced an injury.^{19,24} The majority of them reported will seek help when injuries occurred for a successful outcome. However, only 41% of these respondents knew about the right time to seek treatment where they were able to answer the question on knowledge of the management of dental trauma correctly. Questions regarding avulsion were asked and 65.4% are aware of the need for replantation of the avulsed tooth but 58.9% chose "I don't know" when the duration of replantation was asked while only 8.3% of them answered correctly. This indicates that the respondents' level of knowledge towards specific action needed to be taken for a particular sustained injury is somewhat low. Despite the fact that most of the respondents answered that they were aware of the possibility of replanting avulsed teeth, and the need of immediate action for successful prognosis, 76.6% of them either reported that an avulsed tooth can be replanted up to 6 hours after the accident which is incorrect or did not know the answer. The American Academic of Pediatric Dentistry recommended that replantation must be done at the earliest 20 minutes after the accident, or the long-term prognosis is not favorable.²⁷ In general, the result shows that participants' knowledge was inadequate, jeopardizing their ability to act correctly and accurately when the need arises. Despite the contrary, a study conducted by Schildknecht et al²⁸ stated that more than half of Swiss rugby players are aware of the replantation of avulsed teeth and have encountered the injury. However, in the present study, only 7.1% of Malaysian athletes had experienced it. Hence, the level of knowledge in dental trauma management between those who had previous experience and those who had not might be presented differently in terms of educational approaches.

Most of the respondents in the present study knew of the existence of protective gears with 79.1% are familiar with mouthguards

followed by 14.6% with face shield. These results corroborate with findings from studies carried out in Brazil⁶ and Turkey¹⁸. The use of mouthguards amongst these athletes is low (47.6%) considering that almost 83.9% of them are involved in a contact sport. This study supports that the awareness of the importance of protective gear does not influence the usage of it.^{29,30} Among the respondents who own a mouthguard, the majority of them used stock and boil and bite mouthguards. Both ready-made mouthguards are usually bulky and lack proper retention and would not be comfortable to the wearers, as they need to be held in place by constant occlusal pressure.^{3,14} They could dislodge on high impact hence it is not practically safe to wear. Boil and bite mouthguard can be molded directly in the athlete's mouth, for proper fitting and better retention as it is thermoplastic at low temperature.¹¹ However, it is easily distorted at body temperature and the thickness of the material could decrease up to 99% while biting down in the molding procedure thus making it an improper protection against impact to the lower jaw.^{21,32}

Custom-made mouthguards give better protection than other types of mouthguards because it can provide enough thickness for better protection and offers excellent adaptation to make it more retentive, with trivial deformation even after it has been worn for a long time.^{13,32} Custom-made mouthguard is considered as the gold standard in orofacial trauma protection. Thus, athletes at any level of participation should be encouraged to utilize this mouthguard. Although it is more expensive, they are completely adaptable to the athletes' mouth providing better comfort, retention, and less bulky.^{11,31} In addition, they are more protective since they conform closely to the athlete's mouth, since occlusal table thickness can be customized during fabrication. By wearing a mouthguard, the risk reduction for ongoing complications following dental injuries was reduced.³² This supports the findings published in previous studies that mouthguards can prevent complications if an injury does occur.^{11,26,31,32}

In this study, more than half of the respondents do not own nor use any kind of mouthguard. The reason given for not using any was because of speech disturbance followed by a feeling of discomfort.^{11,31} This might be due to the majority of them were only exposed to a

ready-made mouthguard. Athletes should be informed that properly fitted custom-made mouthguards provide the greatest degree of fit, comfort and protection.¹⁴

There were incidences in Beijing Olympics (2008)³³, where a large number of cases of pericoronitis treatment and mouthguards confection were reported. There were also several treatments being done such as restorations and endodontic treatment. When comparing the number of procedures crippling performed in both games, there is a reduction in performed procedures such as tooth extraction for about 323 cases. Nonetheless, in Brazil Olympic³⁴, 18.11% of athletes also seek care after the trauma but the dentist is not widely placed in sports activities, assuming that they rarely get first aid care. This highlights the philosophy behind the importance of a general dentist on-site to achieve faster care of dental injuries. The fact that only 24.4% of athletes in this study have a dentist in their health department is significantly related to the low self-reported experience of dental injury and the low awareness of mouthguards use. With the stated percentage, the low usage of mouthguards amongst Malaysian athletes is concerning and further action needs to be initiated to increase athletes' awareness of the importance of protective gear. When trauma occurs, prompt management prevents or minimizes psychological or physiologic damage, beyond consequences that may occur as a result of trauma itself.^{11,17} This can be achieved by involving good alliances with specific authorization for expanding and disseminating knowledge. A higher number of dental teams or dentists need to be made available in a sports team to ensure better care of the incidence of dental trauma. Incorporation of topics related to the prevention and management of tooth injury in the education syllabus for the school children may help in increasing the knowledge.^{2,11}

Topics that can be highlighted are the use of mouthguard during sports and early management of tooth fracture or avulsion.⁷ Reinforcement at various level is needed thus constant comprehensive public awareness campaigns on dental trauma should be organized, mainly to improve the awareness on the use of mouthguard amongst people who are active in sports.¹¹

This study has some limitations. The

convenience sampling was used in the present study, might unintended bias in the selection of participant since the survey is voluntary, which make the generalize difficult and specific towards certain sport activity. With a self-administrated questionnaire, there may be discrepancies between objective findings and subjective experience of sports-related injury. However, information obtained from this present study is beneficial to understand the current situation of the sports-related dental trauma among athletes in Malaysia.

Conclusions

Based on the research, most of the athletes answered that they had experienced dental sports injury during sports activity and moderately knowledgeable in the management of dental sports injury. However, despite their awareness, they had not practiced the proper way of caring for their dental health and implementing better usage of mouthguards. It is important that sports participants to be aware of how to respond to a dental injury so that a positive outcome is assured. Prevalence of self-reported orofacial trauma was high in Malaysia especially in a contact sports activity with crown tooth fracture being the most common dental injury besides soft tissue trauma. Acknowledging the benefit of mouthguards does not result in all players using a custom-made mouthguard during sports activities. It is uncommon in the culture of Malaysian athletes to use any type of protective equipment in all sports events because it is only limited to certain types of sports activity. The prevention of injury and subsequent usage of protective gear during sports activities may result in the best outcome.

Declaration of Interest

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