RESEARCH ARTICLE

Sports-related Orofacial Injuries in Children: Awareness and Experience among Sports Coaches in Delhi Region of India

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Abstract

Background: Sports activities are the most important entity of human life for the holistic well-being of an individual. At the same time, it exposes them to a high risk of orofacial injuries.

Aim: The study assessed the level of knowledge, attitudes, and awareness of orofacial injuries in children among sports coaches.

Materials and methods: The sample of this descriptive cross-sectional study consisted of 365 sports coaches across various sports academies in the Delhi region. A questionnaire-based survey was conducted and descriptive analysis was performed. The comparative statistics were computed using the Chi-square test and Fischer exact test. A *p*-value of <0.05 was considered statistically significant.

Results: Among participating coaches, 74.5% of the coaches agreed on the risk of trauma during sports activities that they supervise. The most common type of injury reported by the coaches was 'cut lip, cheek, and tongue' (72.6%), followed by 'broken/avulsed tooth' (44.9%). The mechanism of injury was mainly due to falls (48.8%). Nearly 65.5% of coaches were not aware of the possibility of replantation of an avulsed tooth. Also, coaches exhibited poor knowledge about an ideal storage media for carrying an avulsed tooth to the dentist. The majority (71%) of coaches agreed that their academies had no tie-ups with nearby dental clinics/hospitals.

Conclusion: The sports coaches exhibited inadequate knowledge about the primary management of orofacial injuries and were unaware of the possibility of re-implantation of an avulsed tooth.

Clinical significance: This study also highlights the need for educating coaches about emergency management of orofacial injuries and postponement in immediate treatment or inappropriate treatment due to lack of knowledge may lead to the futile outcome of the treated injured teeth.

Keywords: Awareness, Children, Games, Orofacial injuries, Sports coaches, Trauma.

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Introduction

"The word 'sport' is derived from a combination of words meaning to carry away from work." For all age groups, a physically active lifestyle is necessary.[1] "Some of the major reasons for participation in sports and physical activity are pleasure, relaxation, competition, socialization, and enhancement of overall well-being and fitness."[2] Children can have numerous physical and social benefits by taking part in sports activities. Dynamic interest in sports by youngsters has added to an expansion in sports-related injuries.[3]

"According to the American Academy of Pediatric Dentistry's policy on Prevention of sports-related orofacial injuries, sports mishaps account for 10–39% of all dental injuries in children."[4] It is bothersome that the majority of such injuries happen during active participation in various sports activities.[5] Some observational studies have also suggested that traumatic dental injuries have an adverse impact on oral health-related quality of life in children and adolescents.[3]

Unluckily, children participating in different games are at an elevated risk of getting injury to the orofacial hard and soft tissues. Rate of occurrence of sports-related oral injury varies comprehensively on the game played, level of competition, the participant's age, and sex.[6]

Dental injury among physical game participants regularly includes the upper front teeth, which may chip, break or slacken, or get avulsed. This damage might be disheartening for the youngster in this way, further influencing their appearance, discourse, and capability to consume food.[7]

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Dental injuries which occur during sports activities differ from other dental injuries, as it is possible to easily prevent, and there is also an option to diminish the frequency levels by the utilization of mouthguards that protect all "dental and periodontal structures."[8]

Sports coaches who are incorporated in teaching active sports to children in schools or outside the school usually come across such injuries. Postponement in immediate treatment or inappropriate treatment due to lack of knowledge may lead to the futile outcome of the treated injured teeth. In the absence of parents, sports coaches take responsibility to manage the grievances occurring in playgrounds.[3]

Mouthguards play a significant role in preventing dental injuries. Mouthguards were first introduced by Woolf Krause, a

London dentist, as a means of protecting boxers from lip lacerations (Reed 1894)." [9] Injuries in boys are three times more commonly seen than in a comparison of girls because of their active involvement in sports and games. Children are always at a higher risk of experiencing orofacial injuries during playing and sports activities. However, this risk can be decreased by giving proper instructions to young athletes or children on using mouth guards, helmets, and other protective devices.[10]

In India, university-based diplomas, degrees, and postgraduate programs are offered to be trained as sports coaches. Those without any professional training do go in for sports training of children. Most of the degree or diploma curriculums do not comprise segments on the management of dental trauma. It would be gainful for each game clinical group to consolidate a games dental specialist who might be an expert in bringing issues to light about dental injury anticipation and usage of satisfactory crisis methods when a dental injury happens.[6]

First aid at the site of injury is of prime importance in the management of orofacial injuries. But more significant is the knowledge possessed by sports coaches who are present at the site of injury and who will be the first to decide the primary first aid given to the child and the future course of action.

The present study was undertaken to evaluate the awareness of sports-related orofacial injuries in children amongst coaches of sports in the Delhi region.

Materials and Methods

This descriptive cross-sectional study consisted of 365 sports coaches and was carried out in different sports academies in the Delhi region. Coaches who were training children in private and government sports academies/institutions and who gave consent for the study were included. Whereas, coaches who were not able to comprehend the questionnaire were excluded. A consent form was obtained before their participation. The questionnaires were distributed individually to the coaches on the visit to their sports academies. The questionnaire was self-administered, consisting of open and closed-ended questions, was filled by the coaches under the direct supervision of the chief investigator, and was collected on the same day. Data were analyzed using a statistical package for Social sciences (SPSS version 22 IBM, New York, USA). For this, the data was transported from an excel spreadsheet to an SPSS spreadsheet. The descriptive data were expressed as mean ± standard deviation (SD) and number (percentage, %). The comparative statistics were computed using the Chi-square test and the Fischer's exact tests. A p value of <0.05 was accepted as statistically significant.

Results

Out of 365 sports coaches, 285 (78.1%) were males, and 80 (21.9%) were females. Majority of coaches had up to 5 years of experience in training children. The statistics are summarized in Tables 1 to 5.

Discussion

Occurrence of orofacial injuries, including teeth and oral cavity, are commonly seen during sports activities, and in some cases, they cause deep-rooted sequelae with the significant expense of the treatment. It can bring about functional and aesthetic unsettling influences, which is a trouble for both children and their parents. Further, they influence social conduct.[11]

Traumatic dental injuries are vastly prevalent from infancy to adolescence and frequently occur in schools and sports academies.[11] The active participation of children in sports have increased over the years, especially in contact sports. Injury can happen during any game; however, the chances of injury in contact sports, "sports that involve physical contact between players, e.g.,

Table 1: Gender-wise comparison of coaches' perceptions regarding sports events with injuries

			Sports events with injuries									
			Cricket	*Hockey*	*Boxing*	*Football*	*Wrestling*	*Fencing*	*Skating*	*Soccer*	*Rugby*	*Karate*
Sex	M	*n*	79	35	106	54	26	2	24	12	2	13
		%	27.7%	12.3%	37.2%	18.9%	9.1%	0.7%	8.4%	4.2%	0.7%	4.6%
	F	*n*	26	6	27	11	10	0	4	5	1	1
		%	32.5%	7.5%	33.8%	13.8%	12.5%	0.0%	5.0%	6.3%	1.3%	1.3%
Total		*n*	105	41	133	65	36	2	28	17	3	14
		%	28.8%	11.2%	36.4%	17.8%	9.9%	0.5%	7.7%	4.7%	0.8%	3.8%
p-value			0.233	0.316	0.601	0.324	0.397	0.999	0.475	0.546	0.525	0.319

			Sports events with injuries (Contd.)								
			Judo	*Taekwondo*	*Wushu*	*Handball*	*MMA*	*Kickboxing*	*Squash*	*Swimming*	*Volleyball*
Sex	M	*n*	38	49	0	1	9	3	1	4	10
		%	13.3%	17.2%	0%	0.4%	3.2%	1.1%	0.4%	1.4%	3.5%
	F	*n*	9	17	0	0	1	1	0	0	2
		%	11.3%	21.3%	0%	0.0%	1.3%	1.3%	0.0%	0.0%	2.5%
Total		*n*	47	66	0	1	10	4	1	4	12
		%	12.9%	18.1%	0%	0.3%	2.7%	1.1%	0.3%	1.1%	3.3%
p-value			0.709	0.413	–	0.999	0.697	0.999	0.999	0.58	0.655

Table 1 showed that the overall, boxing was the most recommended sport by both male and female coaches in which there are chances of orofacial injuries, followed by cricket and taekwondo in decreasing order. Gender-wise comparison of responses regarding coach perceptions on sport events with injuries showed that there was no statistically significant difference among male and female coaches regarding it

Table 2: Gender-wise comparison of responses regarding types of injuries during sports

			Type of injuries				
			Bruise	*Cut lip, cheek, tongue*	*Broken tooth/ avulsed tooth*	*Facial bonefracture*	*Loss of consciousness/concussion*
Sex	Males	*n*	115	208	133	106	48
		%	40.4%	73.0%	46.7%	37.2%	16.8%
	Females	*n*	32	57	31	37	19
		%	40.0%	71.3%	38.8%	46.3%	23.8%
Total		*n*	147	265	164	143	67
		%	40.3%	72.6%	44.9%	39.2%	18.4%
p-value			0.948. NS	0.885, NS	0.407, NS	0.337, NS	0.360, NS

No statistically significant difference was found among male and female coaches regarding frequencies of various types of sports injuries. The most common type of injury reported by both male and female coaches was 'Cut lip, cheek, tongue', followed by 'Broken tooth/avulsed tooth'

Table 3: Gender-wise comparison of knowledge of coaches regarding possibility of replantation of avulsed tooth

			Is it possible to replant a tooth?			
			No	*Yes*	*Not sure*	*Total*
Sex	Males	*n*	187	65	33	285
		%	65.6%	22.8%	11.6%	100.0%
	Females	*n*	52	20	8	80
		%	65.0%	25.0%	10.0%	100.0%
Total		*n*	239	85	41	365
		%	65.5%	23.3%	11.2%	100.0%
p-value				0.873, NS		

No statistically significant difference was found among male and female coach's knowledge regarding possibility of replantation of avulsed tooth. Majority of both males and female coaches were not aware of it

Table 4: Gender-wise comparison of knowledge of coaches regarding storage media for carrying an avulsed tooth to the dentist

			How would you store / carry an out of socket tooth to your dentist?					
			In your mouth/saliva	*Water*	*Wrapped in cotton/ cloth*	*HBSS solution*	*Any other*	*Total*
Sex	Males	*n*	19	85	140	14	27	285
		%	6.7%	29.8%	49.1%	4.9%	9.5%	100.0%
	Females	*n*	7	21	38	5	9	80
		%	8.8%	26.3%	47.5%	6.3%	11.3%	100.0%
Total		*n*	26	106	178	19	36	365
		%	7.1%	29.0%	48.8%	5.2%	9.9%	100.0%
p-value					0.894, NS			

No statistically significant difference was found among male and female coach's knowledge regarding storage media for carrying an avulsed tooth to the dentist. Majority of both males and female coaches were not aware of it. Only 7.1% of total study population is aware of this fact

Table 5: Gender-wise comparison of presence of tie-ups of academies with dental clinics or hospital

			Tie-up with dental clinic/hospital			
			No	*Yes*	*NR*	*Total*
Sex	Males	*n*	202	75	8	285
		%	70.9%	26.3%	2.8%	100.0%
	Females	*n*	57	22	1	80
		%	71.3%	27.5%	1.3%	100.0%
Total		*n*	259	97	9	365
		%	71.0%	26.6%	2.5%	100.0%
p-value				0.723, NS		

No statistically significant difference was found among male and female coaches regarding presence of tie-ups of academies with dental clinics or hospitals. Majority of both males and female coaches responded as 'No'

wrestling, boxing, basketball, and karate," are higher in comparison to non-contact sports.[12]

Youngsters associated with sports have encountered different types of dental injuries; however, there is almost no information available among instructors about the avoidance and management of such injuries.[13] During the time of injury, sports coaches are the people who are most likely to be present at the site of injury along with the child. In this way, coaches should be well equipped and capable enough to handle the situation and, at the same time provide basic first aid during a dental emergency.[14]

Training regarding emergency management of traumatic dental and orofacial injuries should be made mandatory for all sports coaches. This will lead to a better prognosis for such accidents in the future. Persons associated with sports should realize that direct referral to a dental specialist increases the prognosis.[11]

According to the present study, about 74.5% of coaches agreed upon the risk of trauma during sports activities, among which 36.4% of the injuries were seen in boxing, 28.8% in cricket, and 18% in taekwondo. Lieger and Von Arx, in 2006, conducted a study which revealed that 48% of the injuries were due to handball, 45% of injuries due to basketball, 59% due to ice hockey, and soccer contributed 24% of the injuries.[15]

Ranalli, in 2000 gave a review that showed that correct and properly close-fitting protective aids like mouth guards, headgear, and helmets inhibit orofacial trauma, including dental injuries. Mandatory regulations regarding the usage of mouth guards reduced football injuries to the face and mouth from 50 to 1.4%. "So the epidemiology of orofacial injuries is enduring a paradigm shift with satisfactory changes in protective aids, their usage, guidelines, and its regulations."[16]

The present study found that the most common mechanisms of orofacial injuries are falls (48.8%), followed by being hit by a hard object (48.5%). But a study conducted in Nigeria by Azodo et al. in 2011 conducted a study regarding the mechanism of orofacial injury reported that being hit by the elbow of an opponent player contributed to 36.9% of injuries, and fall and collision with another player contributed 29.2 and 13.6% of the injury, respectively. This variation in the mechanism of injury can be due to the type of games played in India and Nigeria.[17]

"Heintz WD in 1968 and Kvittem B et al. in 1998 reported that soft tissue lacerations, abrasions, tooth intrusions, avulsions, and crown–root fractures were the most commonly reported injuries of the orofacial region whereas zygoma, mandibular and alveolar fractures were comparatively less observed."[18,19] The present study found that cut lip and cheek (72.6%) followed by broken avulsed tooth (44.9%) were the most commonly observed orofacial injuries. Leiger and Von Arx in 2006 conducted a study that reported 42, 31, and 27% of soft tissue lesions, avulsed tooth, and broken tooth, respectively. "A total of 56.8% of soccer and volleyball coaches reported at least one injury in a season: A cut lip, tongue or cheek."[15] "Rob Berg et al. in 1998 reported in their study that the most common injury observed was cut lip, cheek, and tongue (82.4%). He also recommended that such injuries are of great concern, as they may represent a tooth object impact in which significant tooth damage was avoided only fortuitously."[20]

Sports activities fall under the category of physical activity, which anytime can be the most frequently related to orofacial mishaps requiring first aid. 65.5% of coaches in the present study reported that they are unaware of the re-implantation of the tooth after avulsion. Similarly, Al-Obaida M in 2010 and Toure B et al. in 2011 observed in their studies which were conducted in developing countries like Saudi and Morocco.[21,22]

Lack of knowledge about first aid among coaches is a matter of concern. Accordingly, an essential preparation guide the emergency treatment ought to be given to all game mentors, which could be a piece of their educational plan or meeting with a dental specialist.

In the present study, 71% of coaches reported that their sports institutions/academies do not have any tie-up with a hospital or dental clinic. The replantation of an avulsed tooth should be done as early as possible because delaying in providing emergency dental treatment will lead to an unsuccessful treatment outcome for that particular tooth. So tie-up of the academy with a hospital or dental clinic is the need of the hour. "Hanks balanced salt solution (HBSS) is the most recommended storage medium for preservation of the vitality of periodontal ligament cells of the avulsed tooth. Other preferred storage media are coconut water, milk, white egg, and ORS."[22]

Emerich et al. in 2010 conducted a review-based study that reported similar observations and proposed a campaign named "(Save-a-Tooth boxes) containing an isotonic transport medium, which will help in maintaining the viability of an avulsed tooth for up to 72 hours." The successful prognosis for an avulsed tooth relies upon immediate replantation, which decreases further insignificant harm to cells of the root surface.[23] In the present study, very few sports coaches, 23.3%, were aware of the replantation of an avulsed tooth back into its socket. However, Blakytyn C et al. in 2001 conducted a study that reported that only 10.7% of respondents were aware that a knocked-out tooth could be placed back into its socket, yet they dreaded being litigated for replanting the tooth incorrectly.[24] Present study found that when questioned about the ideal storage media for transportation of avulsed tooth majority of coaches (48.8%) reported that avulsed tooth should be wrapped in a cloth/cotton, and this was used as a storage media to transport avulsed tooth. This indicates that the sports coaches who were knowledgeable about the possibility of replantation of an avulsed permanent tooth did not display adequate knowledge of storage medium and cleaning of an avulsed tooth prior to reimplantation.[3]

This variance in the data could be accredited because of various factors, for instance, past encounters regarding the treatment of an avulsed tooth or statistics from mass media which might be in the form of newspaper or interviews of experts.

Our findings showed that many sports coaches had experienced dental injuries in their students while playing. This suggests the need for sports coaches to be well educated about dental emergency management. A significant role is played by sports coaches in educating, instructing, and encouraging children about all necessary provisions which should be taken during all sporting activities; sports coaches are the main people who make schools or college managements understand the compulsion of protective aids. Hence assessing and updating their knowledge is important in reducing the occurrence of such injuries.

Various informative tools such as learning programs, placards, or brochures are available, which can be utilized for the edification of society. Secondarily, at every sports institution, a dental surgeon should be authorized who will not only provide prophylactic care but will also take therapeutic care into consideration. Furthermore, during all sporting activities, mouth guards should be made obligatory. These footsteps will certainly help in transforming the approach of the parents, sports coaches, and children in the direction of proper usage of protective aids, which will further

help in reducing the rate of orofacial injuries which occur during sports activities.

Conclusion

The findings of this study emphasize a need for dental emergency management to be included in training programs for sports coaches. There is a need to plan a sports preventive strategy at the local level by providing feedback to coaches and children and by promoting the use of orofacial protective devices. Dentists should be appointed by higher authorities at various sports academies/schools for providing adequate information and training to coaches about protective aids and emergency management of orofacial trauma and also counsel patients, especially children, adolescents, and young adults, regarding participation in sports so that adequate oral protection can be recommended. Every sports academy should have a mandatory tie-up with a nearby dental office/hospital for emergency situations.

Clinical Significance

This study highlighted the need for educating coaches about emergency management of orofacial injuries, and postponement in immediate treatment or inappropriate treatment due to lack of knowledge might lead to a futile outcome of the treated injured teeth. Which further might be disheartening for the children, further influencing their appearance, discourse, and capability to consume food.

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