OPEN ACCESS

Saudi Journal of Oral and Dental Research

Abbreviated Key Title: Saudi J Oral Dent Res
ISSN 2518-1300 (Print) | ISSN 2518-1297 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article **Dentistry**

Prevalence of Traumatic Dental Injuries among Professional Sportspersons in Haryana, India

Dr. Diksha Sharma[1*], Dr. Manjunath, B. C[2], Dr. Bhavna Sabbarwal[3], Dr. Rajesh Rohilla[4], Dr. Adarsh Kumar[5], Dr. Nirav Vyas, MDS[6]

[1]Post Graduate Resident, Department of Public Health Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India
[2]Senior Professor & Head, Department of Public Health Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India
[3]Associate Professor, Department of Public Health Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India
[4]Senior Professor & Head, Department of Sports Medicine, Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India
[5]Professor, Department of Public Health Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India
[6]Department of Conservative Dentistry & Endodontics, Centre for Dental Education & Research, All India Institute of Medical Sciences (AIIMS), New Delhi, India

DOI: https://doi.org/10.36348/sjodr.2025.v10i11.004 | **Received:** 12.06.2024 | **Accepted:** 16.07.2024 | **Published:** 15.11.2025

***Corresponding author:** Dr. Diksha Sharma
Post Graduate Resident, Department of Public Health Dentistry, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India

Abstract

***Background*:** Sportspersons often suffer from traumatic dental injuries, which can have significant impact on their appearance and physical health. Thus, immediate evaluation is critical for early management as there are no strict guidelines regarding the usage of preventive strategies. Hence present study conducted to assess the prevalence of traumatic dental injuries (TDI) among sportspersons. ***Material and Methods*:** A cross-sectional study was conducted among professional sportspersons in various sports academies in Haryana. Total sample size was 363. Data collection was carried out with the help of self-structured proforma containing sociodemographic details, knowledge, attitude, and practices and traumatic dental injuries were recorded using Ellis and Davis (1970) classification. Chi-square test was used to find out the difference between variables. Binary logistic regression applied to test the association between traumatic dental injuries and various sociodemographic and dental factors. ***Results*:** The prevalence of traumatic dental injuries was found to be 10.5%. Central and lateral incisors were the most commonly affected teeth with Ellis Class I and II injuries. Female Sportspersons and those involved in contact sports exhibited a higher susceptibility to traumatic dental injuries. The study also revealed a low level of knowledge and attitude among sportspersons towards treatment and management. ***Conclusion*:** The burden of traumatic dental injuries was higher among female sportspersons and those playing contact sports. There is requirement to create awareness among sportspersons to mitigate the effect and to reduce the incidence of traumatic dental injuries.

Keywords: Attitude, Dental trauma, Education, Knowledge, Practices, Traumatic dental injuries.

INTRODUCTION

Sports plays an important role in every nation's socioeconomic development and growth [1]. In the realm of athletics, games and sports unfortunately lead to wide range of injuries, ranging from minor to severe ones that may result in lifelong health problems [2]. These injuries can result from accidents, poor training technique in practice, inadequate equipment, and overuse of a particular body part [2, 3].

In recent years, increased participation in sports activities among sportspersons has also increased the risk of sports related oro-facial and dental injuries [4]. Globally, TDIs have affected almost one billion people and it could rank fifth among the most commonly occurring acute and chronic diseases and injuries [5]. Studies have proved sport activities were among the most important etiologic factors of traumatic dental injuries in adolescent and adult groups particularly among physically active individuals and it contributes to one third of dental injuries [6].

It has been reported that the traumatic dental injuries (TDI) had a global burden of 15.2% in permanent dentition and 22.7% in primary dentition [7].

Results from a recent systematic review and meta-analysis reported that the prevalence of traumatic dental injuries (TDI) represents up to one third of all oro-facial injuries [8]. Certain studies have demonstrated that prevalence of traumatic dental injuries in Asian countries including India was estimated to be 40.6%, while the prevalence of orofacial injury was 17.1% [9]. Also, a recent systematic review of sports-related facial trauma in the Indian population reported that 19.2%–36% of children and adolescents experienced sports injuries, with dental injuries being the most common type of oro-facial injuries [10]. The prevalence of dental injuries among child athletes was reported to be 15.4% [11]. Also, few studies reported dental injuries to be 10 to 36% of all sports-related injuries [12].

Data from previous studies suggested that the rate and type of injury differs depending on various risk factors and have multifactorial etiology including sociodemographic factors and sports related factors such as type of sport, position played, exposure time, insufficient breaktime, verbal abuse, malocclusion and use of personal protective devices like mouthguards [13-15]. Results have shown that contact sports showed the highest prevalence with wrestling, boxing and basketball being the most common type [11, 16, 17]. The most common type of dental injury was crown fracture followed by mobility and avulsion [10, 11, 18].

To effectively safeguard against traumatic dental injuries among sports person, it is crucial for athletes and sports personnel to possess comprehensive understanding of the prevalence, intensity, and preventive measures pertaining to such trauma [19]. Furthermore, sports-related dental injuries significantly affect physical appearance, self-esteem, and emotional well-being, highlighting the importance of preventive measures like mouthguards, proper equipment, and oral hygiene for athletes' overall wellness [20, 21].

It is important to note that most of the literature on the occurrence of traumatic dental injuries is from industrialized nations, with limited data available from developing countries like India, including Haryana, which is known as the sports capital of India. Hence the present study was conducted to assess the prevalence of traumatic dental injuries among Sportspersons in Haryana.

MATERIAL AND METHODS

The present study follows the STROBE guidelines for cross sectional study. Ethical clearance was obtained from the institute ethics committee and written informed consent was obtained from the study participants. Participants were also informed that their participation is voluntary and they have the right to withdraw from the study at any point of time.

A cross-sectional study was conducted to assess the prevalence of Traumatic dental injuries among sports person at different sports centers in Haryana**.** Study period was 6 months.

Inclusion Criteria:

1. Sportspersons in age group of 10-30 years, both male and female.
2. Professional sportspersons actively involved in contact and non-contact sports at different levels i.e. District, State and Nationals.
3. Those who give consent to participate in the study.

Exclusion Criteria:

1. Study participants not willing to participate in the study.
2. Any past medical history present (bone and dental disorders).

Sample size estimation

The sample size was calculated using nMaster software version 2 through hypothesis testing for single proportion with population proportion 0.12, sample proportion 0.17 (calculated through pilot study among 25 participants), 80% power, 5% alpha error for a two-sided test. The calculated sample size was 363 [9].

Randomization

The participants were selected using stratified random sampling from different sports centres in Haryana. Total 363 participants from seven sports centres situated in four districts in Haryana were selected.

Data Collection

Data collection was done with a help of a self-structured proforma containing sociodemographic details, knowledge, attitude and practices and clinical examination. All the sportspersons available on the day of examination were enrolled for data collection.

Study Instrument

A self-structured knowledge, attitude and practice questionnaire was developed in English language on the basis of previous literature and focus group discussions. The questionnaire was modified with addition and deletion of certain items during the course of development. The pilot testing was performed on 25 sports persons to finalize the questions and to check feasibility of the study. The items in the questionnaire were scaled for standardized assessment, reduction of confusion among participants and reliability assessment. Face and content validity was done by three subject experts and reliability of the questionnaire was assessed using Cronbach's alpha (α=0.8).

The Final questionnaire comprises of seventeen questions (six knowledge questions, six attitude questions and 5 practices questions). Each section comprises of three domains

1. Determinants of traumatic dental injuries (TDI)

2. Treatment of traumatic dental injuries (TDI)
3. Prevention of traumatic dental injuries (TDI)

Clinical examination

A trained examiner recorded the knowledge, attitude and practices questionnaire and performed the clinical examination. Oral examination was performed with the help of artificial light, mouth mirror and periodontal probe. Ellis and Davis classification (1970) was used to classify traumatic dental injuries [22].

Training and Calibration

Training and calibration of principal investigator was done prior to the conduction of the study by examining ten patients using Ellis and Davis classification (1970) and replicating measurements by a gold standard examiner. The inter-examiner and intra-examiner reliability was found to be excellent with kappa coefficient values of (κ=0.9) and (κ =0.8) respectively.

Outcomes

The outcome was measured by:

1. Assessing the prevalence of sports dental injury in sportspersons in Haryana.
2. Assessing the knowledge, attitude and practices among sportspersons.
3. Association of TDI with sociodemographic and dental factors.

Analysis of Data

Knowledge was categorized into good and poor knowledge based on mean knowledge scores (<50% score = poor knowledge and >50% score= good knowledge). For attitude, each item was graded on a six-point likert scale and graded into positive and negative attitude where >50 % as positive and <50% scores as negative. For practices assessment, maximum marks ranges from 0-1, where 0 wrong and 1 as right answer. The practices scores were graded into correct and incorrect practices.

Statistical Analysis

The collected data was entered into Microsoft excel and analyzed using SPSS version 22 (Statistical Package for Social Sciences). Descriptive and inferential statistics were applied and results were presented in the form of tables. In descriptive statistics, frequency, percentage and mean ± S.D were computed to describe the characteristics of data depending upon its distribution. Normality of data was assessed using Shapiro-wilk test. In inferential statistics, chi square test was used for categorical variables. Binary logistic regression model was used to study the statistical association between the variables. P value <0.05 was considered statistically significant for each attribute.

RESULTS

In the present study, out of 363 study participants, (59.8%) were females and (40.2%) were males. Mean age was 18 years among both the genders and majority (77.1%) of study participants belonged to middle and lower middle socioeconomic status (B.G Prasad scale 2023). It was found that, out of 363 study participants, 10.5% suffered from various traumatic dental injuries where Elli's class 1 (57.8%) was the most common dental injury followed by class II (31.5%), class III (2.6%), class IV (5.2%) and class VII (2.6%). Maxillary anterior (92.1%) were the most commonly involved teeth followed by mandibular anterior (5.2%) and posterior teeth (2.6%).

Table I: Distribution of study participants according to type of sports

Gender	Type of Sports		Total (N (%)	Chi-square value (P value)
	Contact sports (n (%)	Non-contact (n (%)		
Male	96 (44.7%)	50 (33.8%)	146 (40.2%)	4.306 (*0.038)
Female	119 (55.3%)	98 (66.2%)	217 (59.8%)	
Total	215 (100.0%)	148 (100.0%)	363 (100.0%)	
Phi Cramer`s V – 0.109 (*0.038)				

*Significance at p<0.05; Phi Cramer`s V test

Results have shown that around 57.9% were involved in contact sports and 42.1% in non-contact sports (Table 1). The most common age group having traumatic dental injuries was 16-20 years (45.7%) followed by 10-15 year and 21–25-year age group with 26–30-year age group having the least number of injuries. There was no statistically significant difference found between age and TDI (p=0.686). Females have experienced more (52.6%) traumatic dental injuries than males (52.6%) and there was no statistically significant difference found between gender and TDI (p=0.342). Middle-class socioeconomic status has shown higher (36.8%) prevalence of TDI followed by lower middle (26.3%) and upper middle class (26.3%) and results showed no statistically significant difference between socio-economic status and TDI (p=0.178). Also, study participants with 0-5 years of playing experience have shown higher (81.6%) prevalence of traumatic dental injuries compared to more than 5 years of experience (18.4%) but results were not statistically significant (p=0.855) (Table 2).

Table II: Prevalence of traumatic dental injuries according to Age, gender, education, socioeconomic status, and years of playing sports

Variable		TDI present (n (%)	TDI absent (n (%)	Total (n (%)	Chi-square value (P value)
Age	10-15 yrs.	12 (31.6%)	86 (26.5%)	98 (27%)	1.482 (0.686)
	16-20 yrs.	18 (47.4%)	148 (45.5%)	166 (45.7%)	
	21-25 yrs.	8 (21.1%)	84 (25.8%)	92 (25.3%)	
	26-30 yrs.	0 (1.9%)	7 (0.0%)	7 (2.2%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	
Gender	Male	18 (47.4%)	128 (39.4%)	146 (40.2%)	0.902 (0.342)
	Female	20 (52.6%)	197 (60.6%)	217 (59.8%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	
Education	Upto 5th class	1 (2.6%)	4 (1.2%)	5 (1.4%)	2.536 (0.638)
	Upto 10th class	12 (31.6%)	80 (24.6%)	92 (25.3%)	
	Upto 12th class	11 (28.9%)	113 (34.8%)	124 (34.2%)	
	Under-graduates	13 (34.2%)	125 (38.5%)	138 (38.0%)	
	Post- graduates	1 (2.6%)	3 (0.9%)	4 (1.1%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	
SES	Upper class	4 (10.5%)	21 (6.5%)	25 (6.9%)	6.303 (0.178)
	Upper middle class	10 (26.3%)	47 (14.5%)	57 (15.7%)	
	Middle class	14 (36.8%)	116 (35.7%)	130 (35.8%)	
	Lower middle class	10 (26.3%)	140 (43.1%)	150 (41.3%)	
	Lower class	0 (100.0%)	1 (0.3%)	363 (100.0%)	
	Total	38 (100.0%)	325 (100.0%)	325 (100.0%)	
Years of playing	0-5yrs.	31 (81.6%)	269 (82.8%)	300 (82.6%)	0.034 (0.855)
	>5yrs.	7 (18.4%)	56 (17.2%)	63 (17.4%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	

*Significance at p<0.05; chi-square test

Contact sports have shown higher (60.5%) prevalence of traumatic dental injuries as compared to non-contact sports (39.5%) but there was no statistically significant difference between type of sports and TDI (*p*=0.995). Majority of study participants having TDI had past dental history (92.1%). Dental crowding was absent among majority (89.5%) of study participants experiencing TDI and results showed no statistically significant difference between TDI and dental crowding (*p*=0.964*)* (Table 3).

Table III: Prevalence of traumatic dental injuries (TDI) according to Type of sports, past dental history, and dental crowding

Variable		TDI present N (%)	TDI absent N (%)	Total N (%)	Chi-square value (P value)
Type of sports	Contact	23 (60.5%)	192 (59.1%)	215 (59.2%)	0.030 (0.863)
	Non-contact	15 (39.5%)	133 (40.9%)	148 (40.8%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0 %)	
Past dental history	Present	35 (92.1%)	33 (10.2%)	68 (18.7 %)	150.091 (*0.000)
	Absent	3 (7.9%)	292 (89.8%)	295 (81.3%)	
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	
Dental crowding	Present	4 (10.5%)	35 (10.8%)	39 (10.7%)	
	Absent	34 (89.5%)	290 (89.2%)	325 (89.5%)	0.002 (0.964)
	Total	38 (100.0%)	325 (100.0%)	363 (100.0%)	

*Significance at p<0.05; chi-square test

Majority of study participants (71.1%) had poor knowledge and followed incorrect practices (81.6%) pertaining to traumatic dental injuries. In contrast, the attitude levels of majority of participants (72.5%) were towards positive side. Results showed no statistically significant association between TDI and knowledge, attitude and practices levels (*p*=0.998, *p*=0.573, *p=0.573)* respectively (Table 4).

Table IV: Total Knowledge, attitude and practices levels among Sportspersons pertaining to traumatic dental injuries

Variable		TDI PRESENT N (%)	TDI ABSENT N (%)	TOTAL N (%)	Chi-square value (P value)
Knowledge	**Good**	11 (28.9%)	94 (28.9%)	105 (28.9%)	0.000 (0.998)
	Poor	27 (71.1%)	231 (63.6%)	258 (71.1%)	
	TOTAL	38 (100.0%)	325 (100.0%)	363 (100.0%)	
Mean Knowledge ± S. D		3.026 ± 1.218	2.532 ± 1.516	2.60 ± 1.497	**0.998**
Attitude	**Positive**	29 (76.3%)	234 (72.0%)	263 (72.5%)	0.317 (0.573)
	Negative	9 (23.7%)	91 (28.0%)	100 (27.5%)	
	TOTAL	38 (100.0%)	325 (100.0%)	363 (100.0%)	
Mean Attitude ± S. D		4.368 ± 1.195	4.052 ± 1.463	4.09 ± 1.440	**0.573**
Practices	**Correct**	7 (18.4%)	-	-	-
	Incorrect	31 (81.6%)	-	-	
Mean Practices ± S. D		1.82 ± 0.393	-	-	

Results have shown that 21–30-year age group and females have higher chances of getting TDI compared to 10–20-year age group and males. Among type of sports, contact sports have shown higher chances of TDI compared to non-contact sports. Also study participants having poor knowledge **[1.001 (0.477-2.100), 0.998]** and negative attitude have shown higher chances of TDI **[1.253 (0.571 – 2.750), 0.574].** Results showed no statistically significant association between age, gender, type of sports, years of playing, dental crowding, knowledge and attitude (Table 5).

Table V: Binary logistic regression showing association of TDI with demographic factors and sports related factors

Variable		Coef (B)	S.E	Odds Ratio (Exp.(B))	95% CI Upper- Lower	P-value
Age	10-20 yrs.	1.00				
	21-30 yrs.	0.377	0.417	1.458	0.644 – 3.300	**0.365**
Gender	Male	1.00				
	Female	0.326	0.344	1.385	0.706 – 2.719	**0.344**
Type of sports	Non-Contact	1.00				
	Contact	0.060	.0351	1.062	0.534-2.111	**0.863**
Years of playing	0-5yrs.	1.00				**0.855**
	>5yrs.	-0.081	0.443	0.922	0.387 – 2.199	
Crowding	Absent	1.00				
	Present	0.026	0.558	1.026	0.344 – 3.063	**0.964**
Knowledge	Good Knowledge	1				
	Poor knowledge	0.001	0.378	**1.001**	0.477- 2.100	**0.998**
Attitude	Positive attitude	1				
	Negative attitude	0.226	0.401	**1.253**	0.571 – 2.750	**0.574**

Binomial logistic regression, significance at *p <0.05, ci= confidence interval

DISCUSSION

Sports are most common cause of dental and oro-facial injuries, which often have lifelong consequences on individuals. Depending on how serious the injury is, the athlete can also be eliminated from a major tournament. These complications can be avoided with adequate educational and preventive measures, such as use of mouthguards, especially in activities that increase the risks of injury [14]. Hence the present study was conducted to assess the prevalence of traumatic dental injuries among sports person.

In the present study, the age of study participants ranged from 10 to 30 years with the mean age being 18 ± 4.037 years which was similar to a few studies [23] and less than other studies [11, 13]. Proportions of female participants were more than males, which was similar to some of the studies in previous literature [24]. The prevalence of traumatic dental injuries was found to be 10.5% in the current study, which was in line with the data reported in a systematic review (2023) [8] and study by Shah Y *et al*., (2020) (10.4%) [25].

In the present study, females reported higher levels of traumatic dental injuries as compared to males and 16-20 years was the most common age group experiencing traumatic dental injuries in both the genders. These findings were in agreement with study conducted by Chorney SR *et al*., (2017) [24] but differs with the findings of Mordini L *et al*., (2021) [8] and

Tsuchiya S *et al*., (2017) [13], where male participants showed higher prevalence of traumatic dental injuries. Though the results were not statistically significant with respect to gender and age. It might be due to various factors such as higher proportion of females in the present study and increased participation by females especially in Haryana as it is titled as sports capital of India. This finding showed that female players are also at increased risk and should be made aware of the possible risk factors and preventive strategies.

Present study results have revealed that study participants involved in contact sports had higher prevalence of traumatic dental injuries compared to non-contact sports. Also results from logistic regression analysis have showed that participants playing contact sports have higher odds of getting TDI's. This finding was similar to some studies that also reported higher prevalence in contact sports compared to non-contact sports [11, 16]. Whereas studies conducted by Tiwari V *et al*., (2014) [26] have showed higher prevalence of traumatic dental injuries in non-contact sports. When single sport was considered, among contact sports, boxing, hockey and basketball have shown the highest prevalence. These findings were in agreement with study conducted by Andrade RA *et al*., (2010) [17] and Frontera R. R *et al*., (2011) [27]. The following factors might have contributed to the current findings, direct physical contact with another player, accidental collisions with sports equipment, team members or playing surfaces during training or competitions and various factors such as inadequate use of protective devices and improper technique [28]. This is a significant finding to incorporate target preventive strategies based on type of sports.

Study participants belonging to middle and lower middle class have higher level of traumatic dental injuries compared to upper middle and upper class. These findings were similar to study by Ain T. S *et al*., (2016) [29]. That may be due to higher affordability of protective equipment in upper class and due to limited access, the participants from low-income households are less likely to get dental care [30]. In contrast, study conducted by Mordini L *et al*., (2021) [8] showed higher risk of dental injuries among participants belonging to higher socio-economic status and this was because they had greater access to swimming pools, bicycles, skateboards, horses, and other recreational vehicles than participants from lower socioeconomic backgrounds. Study participants, who had been playing for more than five years had a lower percentage of traumatic dental injuries compared to those playing for less than five years. Results from logistic regression analysis also showed lesser odds of getting traumatic dental injuries among participants playing for more than 5 years. The possible reason behind this finding would be that, with more years of playing a sport, participants develop more experience and expertise, subsequently reducing the chances of getting injured. In contrast, study by Vidovic D *et al*., (2015) [23] stated that increase prevalence of traumatic dental injuries with increased years of playing sports.

Study participants who had past dental history reported the higher prevalence of traumatic dental injuries compared to participants having no past dental injury. The reasons behind this finding could be, increased level of awareness pertaining to their oral health.

In the present study, maxillary anterior were the most common teeth affected followed by mandibular anterior and posterior teeth. The contributing factor for this finding could be location, prominent position of maxillary incisors, making them more susceptible to injury [17]. Findings of the present study corroborates with studies conducted by Shreya S *et al*., (2022) [10] and Qudeimat MA *et al*., (2019) [18], Whereas study conducted by Mojarad F (2020) [11] showed mobility as the most common dental injury followed by crown fracture.

Majority of the participants experiencing traumatic dental injuries had poor knowledge and very few sportspersons had knowledge about TDI, its management and were not aware about preventive measures like mouthguards. Only 35% participants were aware about the fact that an avulsed tooth can be saved by replantation and best time to save the tooth. Similar findings were observed by Shah *et al*., (2020) [25]. Regarding attitude, majority of study participants had positive attitude and results from logistic regression analysis have showed that participants having poor knowledge and negative attitude had higher odds of getting traumatic dental injuries. Similar findings were seen in some studies assessing the knowledge and attitude among sports participants [16, 25, 31]. For practices, majority of study participants were not following correct practices and only (18.4%) were following the correct practices. Around 82% participants were not aware about preventive measures like mouthguard and around half of participants (52.6%) had not taken any treatment for TDI. Similar findings were seen in study by Qudeimat *et al*., (2019) [18], where 75% participants didn't take any treatment for traumatic dental injuries.

The American Dental Association (ADA) have advised athletes to use mouthguards since 1950 in order to reduce the incidence of dento-alveolar damage caused by sports activities [32]. Despite this, athletes were not aware enough to wear the protective devices throughout practice or competition. It shows overall need to improve knowledge for prevention and treatment of TDI and it is crucial for athletes and sports personnel to possess comprehensive understanding of the prevalence and preventive measures pertaining to traumatic dental injuries.

The strengths of present study were that no previous study conducted among professional sports person in Haryana covering a broad spectrum of population and including both contact and non-contact sports, broadening the scope and applicability of findings. The study participants were not aware about the study in advance this helped in minimizing bias in assessment of knowledge and attitude of study participants. One of the major strength of our study was that the principal investigator has assessed the knowledge, attitude, practices and have done the clinical examination thus minimizing the diagnostic bias, social desirability bias and interview bias. There were also certain limitations to our study. Certain sports might have been underrepresented, affecting the study results. Study lacks the information on knowledge and awareness among coaches, as coaches have great impact on sportsperson's life. Player's position and other psychosocial factors were not considered. Also, radiological and clinical examination was not possible.

CONCLUSION

Findings from the present study showed that prevalence of TDI was higher among female players and participants playing contact sports who were having low knowledge and incorrect practice. The study highlights the importance of addressing dental health in sports, promoting physical and oral well-being, and identifying sports with higher risk of dental trauma. This information can also help to develop prevention strategies and reduce healthcare costs.

Declaration

Funding: No funding was received for conducting the present study.

Conflict of Interest: The authors have no conflicts of interest to declare that are relevant to the content of this article.

Ethical approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of University B ((PGIDS/BHRC/23/79)).

Consent: Written informed consent was obtained from the study participants

REFERENCES

1 Barbu, M. C. R., Burcea, G. B., Dumitru, R., & Popescu, M. C. (2020). The contribution of sport to economic and social development. *Studia Universitatis Babeș-Bolyai Educatio Artis Gymnasticae*, *65*(1), 27-38.

2 Al-Qahtani, M. A., Allajhar, M. A., Alzahrani, A. A., Asiri, M. A., Alsalem, A. F., Alshahrani, S. A., & Alqahtani, N. M. (2023). Sports-related injuries in adolescent athletes: a systematic review. *Cureus*, *15*(11), e49392.

3 Abou Elmagd, M. (2016). Common sports injuries. *International journal of physical education, sports and health*, *3*(5), 142-148.

4 Ilia, E., Metcalfe, K., & Heffernan, M. (2014). Prevalence of dental trauma and use of mouthguards in rugby union players. *Australian dental journal*, *59*(4), 473-481.

5 Petti, S., Andreasen, J. O., Glendor, U., & Andersson, L. (2018). The fifth most prevalent disease is being neglected by public health organisations. *The Lancet Global Health*, *6*(10), e1070-e1071.

6 O'Malley, M., S Evans, D., Hewson, A., & Owens, J. (2012). Mouthguard use and dental injury in sport: a questionnaire study of national school children in the west of Ireland. *J Ir Dent Assoc*, *58*(4), 205-211.

7 Petti, S., Glendor, U., & Andersson, L. (2018). World traumatic dental injury prevalence and incidence, a meta-analysis—One billion living people have had traumatic dental injuries. *Dental traumatology*, *34*(2), 71-86.

8 Mordini, L., Lee, P., Lazaro, R., Biagi, R., & Giannetti, L. (2021). Sport and dental traumatology: Surgical solutions and prevention. *Dentistry journal*, *9*(3), 33.

9 Tewari, N., Saji, S., Goel, S., Srivastav, S., Alani, A., Mathur, V. P., ... & Bansal, K. (2023). Prevalence of sports-related traumatic orofacial and dental injuries in Asian countries: a systematic review and meta-analysis. *The Journal of Sports Medicine and Physical Fitness*, *63*(9), 982-994.

10 Shreya, S., Baliga, S. D., & Baliga, S. S. (2022). Sports-related facial trauma in the Indian population-a systematic review. *Journal of Indian Society of Pedodontics and Preventive Dentistry*, *40*(1), 3-8.

11 Mojarad, F., Farhadian, M., & Torkaman, S. (2020). The prevalence of sports-related dental injuries and the rate of awareness of mouthguard use among child athletes. *Prevalence*, *7*(4), 358-364.

12 Kaur, S., Kaur, S., Sadana, G., Gupta, T., & Grover, R. (2021). Assessing the Prevalence of Dental Injuries while Playing Sports as well as Awareness of Preventive Measures in Schoolchildren of Amritsar City: A Cross-sectional Study. *AMEI's Current Trends in Diagnosis & Treatment*, *5*(1), 31-35.

13 Tsuchiya, S., Tsuchiya, M., Momma, H., Sekiguchi, T., Kuroki, K., Kanazawa, K., ... & Hagiwara, Y. (2017). Factors associated with sports-related dental injuries among young athletes: a cross-sectional study in Miyagi prefecture. *BMC oral health*, *17*, 1-9.

14 Singh, G., Garg, S., Damle, S. G., Dhindsa, A., Kaur, A., & Singla, S. (2014). A study of sports related occurrence of traumatic orodental injuries and associated risk factors in high school students in north India. *Asian journal of sports medicine*, *5*(3), e22766.

15 Rose, M. S., Emery, C. A., & Meeuwisse, W. H.

(2008). Sociodemographic predictors of sport injury in adolescents. *Medicine and science in sports and exercise*, *40*(3), 444-450.

16 Al-Arfaj, I., Al-Shammari, A., Al-Subai, T., Al-Absi, G., AlJaffari, M., Al-Kadi, A., ... & Al-Ansari, A. (2016). The knowledge, attitude and practices of male sports participants to sports-related dental trauma in Khobar and Dammam, Saudi Arabia–A pilot survey. *The Saudi dental journal*, *28*(3), 136-141.

17 Andrade, R. A., Evans, P. L. S., Almeida, A. L. S., Silva, J. D. J. R. D., Guedes, A. M. L., Guedes, F. R., ... & Tinoco, E. M. B. (2010). Prevalence of dental trauma in Pan American games athletes. *Dental traumatology*, *26*(3), 248-253.

18 Qudeimat, M. A., AlHasan, A. A., AlHasan, M. A., Al-Khayat, K., & Andersson, L. (2019). Prevalence and severity of traumatic dental injuries among young amateur soccer players: A screening investigation. *Dental traumatology*, *35*(4-5), 268-275.

19 Dhillon, B. S., Sood, N., Sood, N., Sah, N., Arora, D., & Mahendra, A. (2014). Guarding the precious smile: incidence and prevention of injury in sports: a review. *Journal of international oral health: JIOH*, *6*(4), 104-107.

20 Goyal, N., Singh, S., Mathur, A., Makkar, D. K., Aggarwal, V. P., Sharma, A., & Kaur, P. (2017). Traumatic dental injuries prevalence and their impact on self-esteem among adolescents in India: a comparative study. *Journal of clinical and diagnostic research: JCDR*, *11*(8), ZC106-110.

21 Bourguignon, C., & Sigurdsson, A. (2009). Preventive strategies for traumatic dental injuries. *Dental Clinics*, *53*(4), 729-749.

22 Ellis, R. G., & Davey, K. W. (1970). The Classification and Treatment of Injuries to the Teeth of Children, 5th Edn. Chicago: Yearbook Medical Publishers.

23 Vidovic, D., Bursac, D., Skrinjaric, T., Glavina, D., & Gorseta, K. (2015). Prevalence and prevention of dental injuries in young taekwondo athletes in Croatia. *Eur J Paediatr Dent*, *16*(2), 107-110.

24 Chorney, S. R., Sobin, L., Goyal, P., & Suryadevara, A. C. (2017). Maxillofacial injuries among National Collegiate Athletic A ssociation athletes: 2004—2014. *The Laryngoscope*, *127*(6), 1296-1301.

25 Shah, Y., Deshpande, A., Poonacha, K., Bargale, S., Jain, A., & Shah, V. (2020). Evaluation of Perception and Awareness of Dental Injuries among Sports Children Aged 6-18 Years and their Coaches during Contact Sports. *Journal of Clinical & Diagnostic Research*, *14*(12), ZC26-33.

26 Tiwari, V., Saxena, V., Tiwari, U., Singh, A., Jain, M., & Goud, S. (2014). Dental trauma and mouthguard awareness and use among contact and noncontact athletes in central India. *Journal of oral science*, *56*(4), 239-243.

27 Frontera, R. R., Zanin, L., Ambrosano, G. M. B., & Flório, F. M. (2011). Orofacial trauma in Brazilian basketball players and level of information concerning trauma and mouthguards. *Dental traumatology*, *27*(3), 208-216.

28 Oliveira Werlich, M., Honnef, L. R., Silva Bett, J. V., Domingos, F. L., Pauletto, P., Dulcineia Mendes de Souza, B., ... & De Luca Canto, G. (2020). Prevalence of dentofacial injuries in contact sports players: a systematic review and meta-analysis. *Dental traumatology*, *36*(5), 477-488.

29 Ain, T. S., Telgi, R. L., Sultan, S., Tangade, P., Telgi, C. R., Tirth, A., ... & Tandon, V. (2016). Prevalence of traumatic dental injuries to anterior teeth of 12-year-old school children in Kashmir, India. *Archives of trauma research*, *5*(1), e24596.

30 De Lucena, E. H. G., Da Silva, R. O., Barbosa, M. L., De Araújo, E. C. F., Pereira, A. C., & Cavalcanti, Y. W. (2021). Influence of socioeconomic status on oral disease burden: a population-based study. *BMC Oral health*, *21*(1), 1-8.

31 Bhadana, S., Tayal, E., Indushekar, K. R., Saraf, B. G., Sheoran, N., & Sardana, D. (2015). Knowledge and awareness of coaches and athletes regarding the sports-related dental injuries and their prevention in Faridabad. *Current Medicine Research and Practice*, *5*(6), 253-257.

32 Fernandes, L. M., Neto, J. C. L., Lima, T. F., Magno, M. B., Santiago, B. M., Cavalcanti, Y. W., & de Almeida, L. D. F. D. (2019). The use of mouthguards and prevalence of dento-alveolar trauma among athletes: a systematic review and meta-analysis. *Dental traumatology*, *35*(1), 54-72.