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PREVALENCE OF SPORT-RELATED DENTAL INJURIES IN CHILDREN SPORT CENTERS AND THE AWARENESS OF COACHES TOWARD ITS MANAGEMENT, RIYADH, KSA.

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Abstract

This study investigates the prevalence of sport-related dental injuries and the awareness of coaches regarding the management of dental trauma in children's sports centres in Riyadh, Saudi Arabia. Through a cross-sectional design, questionnaires were distributed to both guardians and coaches at randomly selected sports centres that offer a variety of contact and non-contact sports. The study focused on children aged 7 to 14 years and evaluated the frequency of dental injuries, types of injuries, and the use of preventive measures such as mouthguards.

The results revealed that 6% of the children had experienced dental injuries during sports activities, with tooth fractures and displacements being the most common injuries. Notably, the study found a significant correlation between the duration of sports over five years were significantly more likely to experience dental trauma. Despite the evident risk, the participation and the likelihood of sustaining a dental injury; children who had been training for use of mouthguards was remarkably low, with only 5% of children consistently using them during training. Additionally, there was a significant delay in seeking dental care after an injury, with 40% of parents not consulting a dentist at all.

The findings underscore the need for increased awareness and preventive measures, particularly in promoting the use of mouthguards and ensuring timely dental care following injuries. The study contributes to the understanding of dental injury risks associated with prolonged sports participation and highlights gaps in the current preventive practices among young athletes in Riyadh. Recommendations include the implementation of educational campaigns targeting parents, coaches, and children to reduce the incidence of dental injuries and promote better management practices.

Keywords: dental trauma, sports injuries, Pedodontics, prevalence.

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Introduction

AIM OF PROJECT AND SUMMARY

To assess the prevalence of sport related dental injuries and the awareness of coaches toward the management of dental trauma in children sport centers in Riyadh, KSA.

Two formulated questionnaires will be given one to the guardians of children one to the coaches of children sport centers in Riyadh, KSA to evaluate the prevalence and knowledge of management of the dental trauma.

The target groups are children sport center couches and sport children parents.

A random locations of sport centers in Riyadh, KSA will be chosen with respect to all types of sport based on type of contact (Football, Swimming, Gymnastics, Martial art, Other)

PROJECT OBJECTIVES

I. To assess the prevalence of sport dental injuries in children from 6 to 14 years old male and female in sport centers (Soft tissue laceration, tooth mobility or displacement, crown fracture, tooth avulsion,)
II. To assess awareness of coaches toward the management of dental trauma in children sport centers.
III. To assess the use of mouthguard and its relation of dental trauma prevention between the coaches and trainees.

LITERATURE SURVEY AND INTRODUCTION

Traumatic dental injuries (TDI) are recognised as a major global issue, not only as a health risk but also as a significant societal concern. Numerous studies have examined the prevalence of traumatic oral injuries among children and adolescents across various countries, consistently showing that males experience higher rates of trauma than females. Common causes of these injuries include accidents, sports activities, fights, and falls. The severity and type of dental trauma can lead to different complications, such as crown fractures and avulsion. Systematic reviews have found that maxillary central incisors are the most commonly affected, with enamel fractures being the most frequent type of injury [1].

In the Eastern Province of Saudi Arabia, a study by Al-Ansari et al. reported that 39.5% of schoolchildren had experienced dental trauma, with tooth fractures (22.7%) being the most common, followed by tooth displacement (8.7%) and total tooth avulsion (8%) [2]. Similarly, a study in Riyadh by Almajed et al. found that 33% of 354 Saudi boys aged 5 to 6 had suffered from oral trauma, with enamel fractures (71%) being the most common, followed by tooth loss due to trauma (13%) [3].

Contact sports are one of the leading causes of dental injuries. A study in Iran by Mojarad et al. found that the prevalence of sports-related dental injuries was 15.5%, with boys (70.9%) being more affected than girls (29.09%). The types of injuries included tooth mobility (58%), crown fractures (36.4%), and avulsion (5.6%) [4]. In another study by Tea Galic et al., which examined the knowledge and attitudes of young athletes in four contact sports—water polo, karate, taekwondo, and handball—25.3% of athletes experienced orofacial injuries, and 13.5% suffered dental injuries. The highest rates of dental injuries were observed in water polo (18.6%), karate

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(17.2%), and handball (21.8%), with only 41% of athletes using mouthguards [5].

Persic R et al. compared the frequency of dental and facial injuries across Switzerland, Germany, and France, finding that 20.4% of participants had observed a dental injury, while 4.5% had personally experienced one. Less than half of the players and coaches interviewed (47.6%) were aware that avulsed teeth could be replanted, and only 5.1% were familiar with a tooth rescue kit. Mouthguard use was also extremely low, with only one individual reporting regular use [6].

In Italy, Roberto Biagi conducted a study assessing the knowledge of Italian children regarding first aid for sports-related dental injuries. The study revealed that 71.5% of participants believed that immediate management by a dentist was crucial for the successful treatment of dental injuries, yet only 31% knew that an avulsed tooth could be replanted [7].

A study in Libya by Elareibi et al. assessed the knowledge and attitudes of contact sports coaches regarding sport-related dental trauma. It was found that the majority of coaches (74%) had witnessed orofacial injuries during their careers, though less than half (47%) had personally experienced such injuries. Furthermore, only 41.1% of the coaches had received training related to TDI emergencies [8]. Conversely, Tsuchiya et al. studied the factors associated with sports-related dental injuries in young athletes, concluding that inadequate break times, verbal abuse, and physical punishment from coaches were positively associated with the prevalence of dental injuries in young male athletes [9].

Lastly, there is a notable lack of evidence regarding dental trauma related to sports centres. Therefore, this study aims to assess the prevalence of sports-related dental injuries and the awareness of coaches regarding the management of dental trauma and the preventive use of mouthguards in children's sports centres in Riyadh, Saudi Arabia.

RESEARCH DESIGN AND METHODS

This is a cross sectional observation study to assess the prevalence of dental trauma among children who are practicing different types of sports in children sport centers. This study will use two different questionnaires. The first questionnaire will be distributed to the guardians of the children attending sport centers, and this questionnaire will be filled through interview with the guardians. This questionnaire comprises of two different parts. The first part will include demographic data (age and gender) , the type of sports that the child practicing (non-contact, semi contact , full contact), and for how many years the child is practicing this sport. The second part of the questionnaire will ask the guardian if his child experienced any type of dental trauma and the where is location that the dental trauma happened, and did they seek for a dentist after the dental trauma. And the last question will be about the use of mouth guard during the sport.

The second questionnaire is directed to the coaches in sport centers and it’s also from two parts. The first part about demographic data (age and gender), the type of sports training (non-contact, semi contact, full contact), years of experience, and the level of education. The second part will be about if the coach experienced or witnessed any type of dental trauma. The management of dental trauma and avulsed teeth will be asked to assess the knowledge of the coaches about the management of dental trauma, and finally we will ask the coaches about the use of mouth guard and if the recommend using it in their sports.

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Both questionnaires will be assessed on a pilot sample to assess clarity and feasibility. Kappa test will used to assess inter-examiner reliability. The sample size based on sample size calculations will be 300 children and 75 coaches.

The age group will be 7-14 years old because younger ages will not be representative due to lack of compliance with the sport centers and their experience with sport will be less than 1 year usually.

STATISTICAL ANALYSIS:

Descriptive statistics, tables, and graphs will be employed to present the data. An independent t-test will be utilised to compare the means between two different groups, while a one-way ANOVA will be applied to compare the means across more than two groups. A chi-square test will be conducted to examine the relationship between two categorical variables. The level of significance was established at $p<0.05$.

STUDY SELECTION AND INCLUSION CRITERIA

I. Children age group 7-14 years old
II. Males and females
III. Children sport Centers in Riyadh will be randomly selected
IV. All types of sports will be included (non-contact, semi contact, contact)
V. Children sport coaches older than 18 years
VI. Willing to participate and complete questioner answering

Results:

Table 1: Descriptive analysis of the data

Variables	Frequencies
Nationality	Saudi: 78% Non-Saudi: 22%
Gender of the child	Male: 86% Female: 14%
Age of the child	Less than 6 years: 5% 6-8 years: 24% 9-11 years: 35% 12-14 years: 18% Over 14 years: 18%
What type of sport does your child play	Football: 66% Swimming: 14% Gymnastics: 5% Martial arts: 14% Paddle: 1%
How long has your son been training	1-5 years: 32% Less than 1 year: 61%

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	Over 5 years: 7%
Has your son ever experienced dental injury during sports Activity	Yes: 6% No: 94%
If yes what kind of dental injury was it	Moving or displacing teeth: 40% Tooth fracture: 40% Tooth loss: 20%
If yes where did the injury take place	Home: 20% Sports Centre: 40% Elsewhere: 40%
When did you see the dentist for the dental trauma	Within the first hour: 20% Within 24 hours: 20% More than 24 hours: 20% Dentist not visited: 40%
Do you wear a mouth guard during training	Yes: 5% No: 85% Sometimes: 10%
If yes who advised you to wear it	Coach: 75% Father: 8% Friend: 8% Social media: 7%

The analysis of the data reveals several interesting findings regarding the demographics, sports participation, and the incidence of dental injuries among children. A significant proportion of the sample consists of Saudi children (78%), with males representing the overwhelming majority (86%). The age distribution shows that most children are between 9-11 years old (35%), followed by 6-8 years (24%). Football is the dominant sport played by these children (66%), with much smaller percentages participating in swimming (14%), martial arts (14%), gymnastics (5%), and paddle sports (1%). The majority of these children have been training for less than one year (61%), with only 7% having trained for over five years. Regarding the incidence of dental injuries, it was found that only 6% of the children experienced such injuries during sports activities. The types of dental injuries reported were mostly moving or displacing teeth (40%) and tooth fractures (40%), with a smaller percentage involving tooth loss (20%). These injuries occurred mainly at sports centers (40%) or elsewhere (40%), with fewer incidents happening at home (20%). Interestingly, when dental injuries occurred, only 20% of the parents sought dental care within the first hour, and 40% did not visit a dentist at all. The use of mouthguards during training was low, with only 5% of children consistently wearing one, and coaches being the primary advisors for those who did wear them.

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Table 2: Comparison among the study groups

		Has your son ever experienced dental injury during sports activity		P-value
		Yes	No	
Less than 6 years		25%	75%	.530
6-8 years		5%	95%	
9-11 years		7%	93%	
12-14 year		0%	100%	
Over 14 years		7%	93%	
		Has your son ever experienced dental injury during sports activity		
		Yes	No	
Saudi		3%	97%	.064
Non-Saudi		18%	82%	
Male		7%	93%	.463
Female		0%	100%	
Type of sports played	Football	8%	92%	.881
	Swimming	9%	81%	
	Gymnastics	0%	100%	
	Martial arts	0%	100%	
	Paddle	0%	100%	
Years of training	1-5 years	0%	100%	.018*
	Less than 1 year	6%	94%	
	Over 5 years	33%	67%	

From a statistical perspective, one of the most significant findings is the relationship between the years of training and the likelihood of experiencing a dental injury, with a P-value of .018. This result indicates that children who have been training for over five years are significantly more likely to experience dental injuries compared to those who have been training for a shorter duration. This may suggest that the longer exposure to sports activities increases the risk of injury,

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highlighting the importance of preventive measures such as wearing mouthguards, especially for those with extended training histories.

On the other hand, the analysis did not find significant relationships between dental injury incidence and other demographic factors such as the child's age (P-value = .530), nationality (P-value = .064), or gender (P-value = .463). Similarly, the type of sport played did not significantly impact the likelihood of dental injuries (P-value = .881). These findings suggest that while the duration of sports participation is a critical factor, other variables like age, gender, nationality, and the specific sport may not play a significant role in the occurrence of dental injuries in this sample.

Discussion

The present study provides valuable insights into the demographics, sports participation, and incidence of dental injuries among Saudi children. The sample predominantly consisted of Saudi nationals (78%) and males (86%), with football being the most popular sport (66%). Despite the relatively low incidence of dental injuries (6%), children with over five years of training were significantly more likely to experience such injuries, highlighting the increased risk with prolonged sports participation.

Regarding the incidence of dental injuries, the present study found that only 6% of the children had experienced such injuries during sports activities. This is consistent with previous studies conducted among water polo and taekwondo coaches, where a similarly low incidence of dental injuries was reported [10,11]. However, it is worth noting that these studies [11,12,13] also highlighted the importance of using mouthguards (MG) as a preventive measure, something that was less commonly observed in the present study, where only 5% of children consistently wore mouthguards during training. The reluctance to use mouthguards due to discomfort, such as difficulties in breathing, was a common theme across both the present and past studies [11].

The types of dental injuries observed in the present study, including moving or displacing teeth (40%) and tooth fractures (40%), are consistent with previous research, which also identified fractured teeth as the most common injury [12]. However, the prevalence of avulsion (tooth loss) was relatively low in the present study (20%), aligning with findings from studies like the one conducted among Benghazi contact sports coaches, where avulsion was reported as the least experienced injury (4%, 2.6%) [14].

Interestingly, the present study revealed a significant delay in seeking dental care following an injury, with 40% of parents not visiting a dentist at all. This contrasts sharply with the recommendations of the International Association of Dental Traumatology (IADT), which emphasizes the importance of immediate replantation of avulsed teeth within one hour to preserve the vitality of the periodontal ligament and prevent long-term complications [15]. The delayed response observed in the present study suggests a lack of awareness or preparedness among parents, a finding that is somewhat inconsistent with previous studies, which often report a higher level of awareness and urgency in managing dental injuries among sports participants [14].

One of the key findings in the present study is the statistically significant relationship between the years of training and the likelihood of experiencing a dental injury (P-value = .018). This suggests that children who have been training for over five years are significantly more likely

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to experience dental injuries. This finding is consistent with past studies that have shown an increased prevalence of traumatic dental injuries (TDIs) with prolonged and more frequent participation in physical activities. For example, research conducted in South Korea found that participants engaging in high-intensity physical activity on four or more days a week had a higher prevalence of TDIs [16]. This supports the idea that extended exposure to sports increases the risk of dental injuries, emphasizing the need for preventive measures such as mouthguards.

However, the present study did not find significant relationships between dental injury incidence and other demographic factors such as age, nationality, or gender. This result contrasts with several previous studies that have reported a strong association between demographic characteristics and the prevalence of TDIs. For instance, multiple studies have documented that boys are more prone to TDIs than girls, with some reporting a higher incidence among boys by as much as 17.2% compared to girls [17]. Similarly, the lack of a significant association between age and TDIs in the present study diverges from other research, which has shown varying associations, with some studies indicating a positive correlation between age and the risk of dental injuries, while others found a negative or no correlation[18,19,20].

The present study also found that the type of sport played did not significantly impact the likelihood of dental injuries (P-value = .881). This finding contrasts with research that has shown differences in TDI prevalence based on the type of sport, with contact sports like football and rugby generally associated with a higher risk of injuries compared to non-contact sports [17]. In the present study, football was the most commonly played sport (66%), but this did not correlate with a higher incidence of dental injuries, which may suggest that factors other than the sport itself, such as the use of protective gear, play a more critical role in preventing injuries.

The study provides important insights into the demographics, sports participation, and incidence of dental injuries among Saudi children, particularly highlighting the increased risk of dental injuries in children with over five years of sports training. Despite the overall low incidence of dental injuries (6%), the study found that prolonged training duration significantly increases the likelihood of such injuries. Additionally, the study observed that only 5% of children consistently wore mouthguards, and a significant delay in seeking dental care was evident, with 40% of parents not visiting a dentist after their child sustained an injury.

Strengths

The study's strengths lie in its comprehensive analysis of various factors influencing dental injuries, including training duration, age, nationality, and type of sport. The identification of a statistically significant relationship between extended training and the increased risk of dental injuries is particularly valuable, as it underscores the need for preventive measures. The study also contributes to the understanding of the relatively low usage of mouthguards and the delay in seeking dental care, offering a clear picture of the current situation in Saudi children's sports participation.

Limitations

A key limitation of the study is its reliance on self-reported data, which may introduce bias or inaccuracies in reporting injuries and mouthguard usage. Additionally, the study's focus on a

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specific population (Saudi children) limits the generalisability of the findings to other regions or demographics. The cross-sectional nature of the study also restricts the ability to establish causal relationships between the variables.

Future Recommendations

To address the identified issues, it is recommended that educational campaigns be developed to raise awareness among parents, coaches, and children about the critical importance of wearing mouthguards and seeking prompt dental care after injuries. Future research should explore the underlying factors contributing to the low usage of mouthguards and the delay in seeking dental care, aiming to develop targeted interventions that can effectively reduce the risk of dental injuries in young athletes. Additionally, expanding the study to include a more diverse population could provide a broader understanding of the issue across different regions and cultures.

Conclusion

The study provides crucial insights into the prevalence of sport-related dental injuries among children in Riyadh and the awareness of coaches regarding their management. The research found that while the overall incidence of dental injuries was relatively low, prolonged sports participation significantly increased the risk of such injuries. Specifically, children who had been engaged in sports for more than five years were more likely to experience dental trauma, particularly tooth fractures and displacements. This highlights the importance of preventive measures, especially the consistent use of mouthguards, which was found to be alarmingly low, with only 5% of children regularly using them.

A significant concern revealed by the study was the delay in seeking dental care following an injury. The fact that 40% of parents did not consult a dentist after their child sustained a dental injury indicates a lack of awareness or preparedness to handle such situations. This delay in response contrasts sharply with the guidelines set by the International Association of Dental Traumatology, which recommend immediate action to prevent long-term complications.

The findings suggest that there is a critical need for educational interventions aimed at increasing awareness among parents, coaches, and young athletes about the risks of dental injuries and the importance of timely and appropriate responses. These educational campaigns should focus on promoting the use of mouthguards and educating all stakeholders on the importance of immediate dental care following an injury. Additionally, further research should explore the underlying reasons for the low adoption of mouthguards and delayed dental care to develop targeted strategies that can effectively mitigate these risks. Expanding the scope of the study to include a more diverse population would also enhance the generalisability of the findings, providing a broader understanding of the issue across different regions and cultures.

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