Educational actions for when traumatic dental injuries occur in athletes

ABSTRACT
Monitoring oral health is increasingly important in the sporting world, however, it is often considered the least priority in terms of regular check-ups, especially for athletes and sportsmen. Giving continuity to the research begun in 2015, in the period January 2022 to January 2023, an experimental study with a pre-experimental design was carried out to identify the effect caused by the educational actions on the level of information regarding the behavior to follow in the event of traumatic dental injuries, in a sample of 63 athletes and 9 combat sports coaches, school category (14-15 years old) of the Héctor Ruiz Pérez School of Sports Initiation School, of the Villa province Clara, the pre-post test comparison was carried out, two surveys were applied, one for the athletes and the other for the coaches, revealing results that showed a small significant change towards the positive in the level of information on the topic in the population intervened in both periods studied.
Keywords: traumatic injuries, dental, sports, educational actions.

Introduction

Oral care is often a secondary priority, however, it is crucial to understand that oral disease can trigger larger scale problems in the rest of the body, directly impacting other organs such as the heart, stomach, liver and all. the musculoskeletal system.

Oral health and sports are closely related to each other. Performing physical activity requires efforts and physiological processes in which the entire body intervenes; even the oral cavity. Having dental injuries can negatively influence the performance of certain practices. Any inflammatory or infectious process increases the risk of suffering muscle injuries. Inflammatory processes and infections in the mouth can spread beyond the oral cavity, affecting other parts of the body. Oral problems that cause pain or make eating difficult also have a negative impact on the athlete's performance.

The relationship between sports and dental health is bidirectional: physical exercise contributes to a healthy mouth, while poor oral health can negatively affect sports performance. Several studies have shown that athletes have a higher risk of developing conditions such as cavities, dental erosion, periodontal diseases and bruxism.

Rodríguez et. al (2021) in his study analyzed 34 samples belonging to different groups of elite athletes from different disciplines. The results showed that the prevalence of trauma ranged between 14% and 47%, cavities between 15% and 75%, dental erosion between 36% and 85%, and periodontitis was 15%. A percentage of between 5% and 18% of these athletes reported that their oral health problems could have negatively influenced their sports performance.

Athletes' oral health can be affected by several causes, such as a missing tooth, which can make chewing difficult and affect nutrient absorption and energy production. Additionally, breathing may be affected, which can make high-intensity activities difficult and result in performance below the athlete's potential.

On the other hand, oral health can also affect the quality of life of athletes and, in turn, their performance in sport. Oral infections and gum inflammation can cause pain, discomfort, and a decreased ability to concentrate. These factors can negatively affect performance, since focus and attention are essential in any sporting discipline, which is why dental health is a crucial factor in sports performance.

According to García et. al (2020) dental injuries in sports can be caused by a variety of factors such as the speed of the activity and the intensity of the impact. In most cases, dental injuries result from direct blows to the hard tissues of the mouth, which can cause tooth breakage, loss, and displacement. These are an important concern in sports due to their prevalence and their impact on oral health.

Authors like Guerra et. al (2022); Córdova et. al (2019) and Pérez et. al (2022) highlight the high prevalence of dental trauma, identifying violent sports activities inherent to sports such as Boxing and Ice Hockey as determining factors of this event. The emotional degree or intensity is another element that can increase the risk of these injuries during competition. As well as, the competitive level, where Polmann et al. (2019) in their study shows a higher percentage of orofacial injuries in high-level competitions due to greater responsibility on the part of the athletes.

Pérez et al. (2022) states that the prevalence of dental injuries during sports practice can reach up to 45%, with the most frequent being dislocations and dentoalveolar fractures.

To prevent these injuries, the use of oral protectors and education on oral health and prevention of dental trauma in athletes is recommended. Mouthguards minimize the risk of oral accidents and help prevent injuries to the jaw, gums and lips.

Additionally, it is important for athletes to know the risks associated with dental injuries and take the necessary steps to prevent them. This includes wearing mouthguards and correcting any oral problems that may increase the risk of injury.

Statistical data reflected in the study by Martínez et. al (2023) indicate that between 80% to 90% of athletes who suffered an injury to the oral cavity do not receive medical attention at the time of the incident, nor do they seek treatment afterwards.

There are multiple risk factors that can increase the possibility of suffering a dental injury during sports. These include the type of sport, the age of the athlete, participation in violent sports activities, the level of emotional activity and exposure to violence.

Valdés and Valle-Lizama (2021) examined 1772 patients, of which 82 were reported to have one or more dental traumas, representing 4.63%. Ages 10 and 14 were the most affected with 7.26 and 5.42% respectively. The male sex was affected in 61%, with 50 patients, predominating over the female sex, which contributed 32 cases for 39%.

In the current context and according to clinical experience, there is little or almost no preparation on how to proceed correctly when these injuries occur on the part of coaches and athletes. It is a field in which it is necessary to work so that health professionals, coaches and athletes are informed about prevention measures and action protocols in case of dental injuries. Education on this topic is key to reducing the incidence of injuries and future complications thereof and guaranteeing prompt and appropriate care in the event of this type of accident.

Due to the above, the objective of the present work was: to compare the effectiveness of educational actions on the level of information about the procedure in the event of traumatic injuries in combat sports in the school category of 14-15 years of the Provincial EIDE of Villa Clara. in the periods (2014-2015 and 2022-2023).

Materials and methods

A quantitative pre-experimental experimental study was carried out with the objective of comparing the level of information acquired with the application of educational actions. The study universe was made to coincide with the one selected at the beginning of the research, that is, with the 254 athletes and 33 coaches of the 6 combat sports practiced at the “Héctor Ruiz Pérez” Provincial School of Sports Initiation School (EIDE). of Villa Clara, in the period from January 2022 to January 2023, distributed as follows:

Sport	Athlete registration	Coaching registration
Boxing	42	6
karate'do	22	4
fencing	38	6
Judo	42	6
wrestling	66	7
taekwondo	44	4
Total	254	33

The sample was made up of 63 athletes, whose size represented 20% of the study population. For the proportional assignment of sample sizes, the following expression was used:

$$nh = \frac{Nh \times n}{N}$$

Where:

nh = sample size of stratum h

Nh = Universe of stratum h

n = sample size

N = Population

With the application of the same selection criteria, from the population made up of the 33 coaches of the aforementioned sports, a sample made up of 9 units of analysis was formed. At an empirical level, surveys and interviews were carried out equal to the initial study, one for the athletes and another for the coaches, which included questions related to previous information on dental injuries, recommended actions and current management practices on the subject in question. study. This made it possible to evaluate the effectiveness of the educational actions previously implemented and identify areas for improvement.

At the mathematical level, empirical frequency distributions were used to analyze the data collected in the surveys and interviews. This allowed us to identify patterns and trends in the level of information and practice of athletes and coaches in both periods examined.

Results and discussion

Educational actions to implement in the event of dental trauma

By raising awareness and implementing educational actions, athletes, coaches and parents can create a safer environment for sports participation.

Topic 1: Familiarization with the appropriate vocabulary.

Objective: to introduce coaches and athletes to the appropriate vocabulary to work on issues related to dental trauma injuries.

Support materials: Word list, dental trauma prevention and education brochure.

Procedure:

1. Introduction by the facilitator about the use of scientific or complicated words used in dental trauma topics and their understanding, as well as the feasibility in situations that require it.

2. The group will be organized into subgroups of 8 or 10, each group will be given a sheet of paper on which 5 words will be written down and the prevention and education brochure on dental trauma, as material that serves as a reference for the preparation. of possible definitions. The activity will be indicated by explaining to the participants that from the materials they have received they will develop the definitions of the words that they have given to each subgroup. It is suggested that when developing the definitions they do so in simple language for better understanding. He will give an example, based on any of the most used terms on the topic.

LIST OF WORDS	
Dental trauma:	Dental traumas are attacks caused by a violent event that can have direct consequences on the teeth and the tissues that surround them, for example a punch, a traffic accident or a fall from a bicycle.
Crown fracture:	Breakdown of one or more tissues of the crown of the tooth.
Root fracture (or radicular):	Break that is characterized by being found in any part of the root.
Concussion:	Injury to one of the tissues surrounding the root (ligament) the tooth does not have mobility, nor does it move.
Dislocation:	When the tooth is mobile.
Exarticulation or avulsion:	The tooth moves (comes out) completely from the socket.
Enamel:	First tissue that covers the crown of the tooth, very resistant.
Incisor:	Upper and lower anterior teeth, which are used to incise or cut food.

Socket:	Part of the maxillary bone (covered by the gum) where the tooth root is included.
Protrusion:	Incorrect position adopted by the upper teeth with respect to the lower teeth, being inclined outwards.
Mouthguard:	Specific and individually designed accessory to protect the individual from traumatic injuries to the oral cavity caused by different external factors.
Reimplant:	Replace the tooth inside the socket.
Necrosis:	Death of a tissue, in response to a certain stimulus, to which it could not adapt (loss of vitality).
Occlusion:	Contact relationship established between the teeth of the upper jaw and the mandible.

1. Allow 15 minutes for the definitions to be developed and presented to the group.

2. Guide each subgroup in selecting a speaker to present their definitions and inform all participants that they must ask questions or criticize the definitions that are presented when they are not clear or simple.

3. When everyone has presented their definitions, the following will be discussed:

How do you feel when a person uses words you don't know when addressing you?

¬ What are the likely reactions?

¬ Does this situation interfere with the best choice of your decisions?

4. After the group exchange, it is advisable to provide participants with information about bibliographic or computer resources to complement what they have learned.

Topic 2: What to do in case of dental avulsion?

Objective: Contribute to athletes and coaches acquiring knowledge to act appropriately in the event of dental avulsion.

Support material: previously prepared cards, in which a problematic situation related to dental avulsion is incorrectly described.

Procedure:

1. The facilitator introduces the activity by selecting a group of people who will carry it out. He will explain to them that at first they will represent the situation in which a person suffers a dental avulsion and proceeds incorrectly.
2. There will be an intermission in which the facilitator leads the group to reflect and debate the dramatized situation, thus arriving at the appropriate way to proceed.
3. The group will then represent the situation correctly.
4. Questions will be asked such as:

¬ What did you think, did you like it?

¬ What did they learn from what was represented?

Topic 3: What I should know and do if I suffer a traumatic dental injury.

Objective: Contribute to athletes and coaches acquiring knowledge that allows them to act appropriately in the event of a traumatic dental injury.

Support material: Paper or cards on which the sentences to be completed will be written down.

Procedure.

1. The facilitator selects a number of known phrases and writes half of each phrase on a piece of paper or card, example: the time to go to consultation when a trauma occurs is…immediately on another (the number of papers It will be equal to the number of participants in the group). The folded papers are put in a hat or box, each participant takes one out and tries to find the member or members of the group who has the other half of their sentence.

Sentence Completion	
People at risk of dental trauma	practice of combat sports, non-use of mouth guard, dental malocclusion, use of piercing.
Time to receive treatment	It is vital, immediate.

If the tooth was fractured	Collect the fragments and take them to a dental office immediately.
Tooth displaced outward or sideways	It is about moving to the original position and immediately going to the dentistry consultation.
Tooth that goes into the gum	Go immediately to the stomatologist.
Avulsed and dirty tooth	Look for the tooth, take it by the crown, wash it only with saline solution, insert it into its place and go quickly to the stomatologist.
Means of transportation if you decide not to replace the tooth	Mil under the tongue. physiological saline.

2. The facilitator will have each group read the phrase they formed and starting from this moment will encourage a short debate through questions with the purpose of clarifying possible doubts and reinforcing knowledge.

Topic 4: What are the factors or causes that can cause dental trauma.

Objective: To help coaches and athletes identify the risk factors for traumatic dental injuries, as well as the behaviors that put them at risk of suffering dental trauma and strategies to prevent them.

Materials: Sheets of paper or cards with various behaviors, blackboard, chalk.

Procedure:

1. The facilitator introduces the activity by explaining that there are predictable situations that can cause dental trauma; establishing an assessment of how that conclusion was reached, emphasizing that the risk of suffering dental trauma exists for all people, even if risky behavior is not sustained, here is the importance of learning to behave in these situations.

2. Two headings related to risk and behavior will be written on the board.

♣ Behavior, factors and causes of low risk

♣ Behavior, factors and causes of great risk

3. The facilitator will give each participant a card or sheet on which one of the different behaviors will be written and will invite them to place them under the heading that they consider corresponding. 10 minutes will be given to carry out the activity.

BEHAVIORS	
Low-risk behavior, factors and causes • Correct use of the mouthguard. • Possess a normal occlusion. • Do not participate in violent games.	Behavior, factors and causes of high risk • Non-use of mouthguard. • Tooth protrusion. • Violent games with hard objects. • Biting objects such as pencils, and having foreign objects in the mouth, such as piercings, can also cause trauma, ranging from wounds to dental fractures.

4. Once the card is located, the facilitator will promote the analysis of what each participant has placed in the columns, always trying to maintain the group's interest in the activity. In case of differences in the criteria regarding the decisions presented, an explanation will be sought to reach the correct identification.

5. The following discussion points can be promoted:

¬ What can an athlete engaging in risky behavior do to reduce the risk of dental trauma?

¬ How can we contribute to a greater number of athletes assuming lower risk behaviors for dental trauma?

According to Escobedo (2019) and Ferrés (2018), there is a coincidence with the results of this research in which the knowledge of how to proceed in the event of dental trauma is evident. 96.3% of the coaches gave correct answers in the questionnaires, leaving a margin of 3.7% of those who do not know how to correctly face this type of situation.

Table 1. Distribution according to responses regarding the optimal time to receive dental care after receiving dental trauma. Comparison of results between the same study carried out in the period 2014-2015 and 2022-2023.

Athletes		**Coaches**	
Period measurement 2014-2015	Period measurement 2022-2023	Period measurement 2014-2015	Period measurement 2022-2023

90,1%	94.20%	88.90%	96.30%

The effectiveness of the research in this case was 7.4% in the case of the coaches. Athletes, for their part, reflected an increase of 4.1% compared to the previously studied period, which indicates an improvement in the understanding and application of recommendations on the appropriate time to receive dental care.

In the study carried out by Qudeimat (2019) it was observed that 36.6% of the patients came within a period between 4 and 24 hours after the damage and within these, between 2 and 4 hours, 20.6%. This finding is important since the time elapsed between the moment any traumatic injury to the teeth occurs and the care received is a key factor in the success and recovery of the affected tooth.

Regarding information about the medical service to contact after receiving a traumatic injury to the teeth. In the study carried out, it was observed that 95.2% and 97.1% of those surveyed responded correctly (go to the stomatology service).

Table 2. Distribution according to the responses about the service to go to after suffering a traumatic dental injury. Comparison of results between the same study carried out in the period 2014-2015 and 2022-2023.

Athletes		**Coaches**	
Period measurement 2014-2015	Period measurement 2022-2023	Period measurement 2014-2015	Period measurement 2022-2023
92,1%	95.20%	77,8%	97.10%

This is important since knowledge about which medical service to go to for treatment can influence how quickly you seek medical attention when you suffer a dental injury.

Regarding the use of mouthguards, it was observed that 96.4% of athletes recognize the importance of using mouthguards to reduce injuries in the oral cavity. With respect to the previous study, the work of the coaches is appreciated, who fully recognize the importance of this addition, exceeding this result by 7.6%.

Table 3. Distribution according to knowledge about the importance of using mouthguards in sports that require it. Comparison of results between the same study carried out in the period 2014-2015 and 2022-2023.

Athletes	**Coaches**

Period measurement 2014-2015	Period measurement 2022-2023	Period measurement 2014-2015	Period measurement 2022-2023
88.80%	96.40%	100%	100.00%

Athletes often do not use mouthguards despite being aware of their protective capabilities and despite widely available literature advising their use. Mouthguards are an essential tool to prevent dental injuries in athletes. They help protect the jaw, gums and teeth from impacts and knocks during sports activities.

The little knowledge that the athletes have about the procedure in the event of dental exarticulation avulsion was evident. In this sense, the correct answers were distributed as follows: of the three actions that could be marked as correct, the one that obtained the highest percentage was: putting the tooth in a liquid and go to the stomatology service with 68.9%, followed by: taking the tooth, placing it inside the mouth and going to the stomatology service with 60.5%, leaving the subsection: take the tooth by the crown, reimplant it instead and go to the stomatology service, in 48.7%.

On the other hand, the correct answers of the trainers were distributed as follows: 97.4% for the option: put the tooth in a liquid and go to the stomatology service, and 86.1% for: take the tooth, place it inside the mouth and go to the stomatology service and take the tooth by the crown, reimplant it in its place and go to the stomatology service for each case.

Table 4. Distribution according to the responses regarding the procedure in the event of tooth avulsion. Comparison of results between the same study carried out in the period 2014-2015 and 2022-2023.

Proceed in the event of tooth avulsion	**Athletes**		**Coaches**	
	Period measurement 2014-2015	Period measurement 2022-2023	Period measurement 2014-2015	Period measurement 2022-2023
Control bleeding with a handkerchief or similar	39.7%	59.7%	33.3%	97.3%
Take the tooth by the crown, reimplant it in	15.30%	48.70%	19.80%	86.1%

its place and go to the stomatology service.				
Put the tooth in liquid and go to the stomatology service.	34.9%	68.90%	44.4%	97.4%
Take the tooth, place it inside the mouth and go to the stomatology service.	25.3%	60.50%	17.3%	86.1%

Through these results it is evident that there are significant improvements in the level of information shown by athletes and coaches, with the latter being the ones with the best results at 53% and 75% on this topic.

Regarding incorrect answers (controlling bleeding with a handkerchief or similar), it was found that athletes had the highest percentage, 59.7%, but showing an advance of 20% compared to the previous period. In the case of the coaches, only 2% responded incorrectly, giving a margin of 64% of effectiveness of the study.

When faced with how to proceed with a dirty avulsed tooth, 75% of the athletes responded correctly to the item: take it by the crown, wash it with saline solution without scraping the root.

Table 5. Distribution according to the responses regarding the procedure for dealing with dirty teeth. Comparison of results between the same study carried out in the period 2014-2015 and 2022-2023.

Proceed when the tooth is dirty.	**Athletes**		**Coaches**	
	Period measurement 2014-2015	Period measurement 2022-2023	Period measurement 2014-2015	Period measurement 2022-2023
Wash it with a toothbrush.	82,5%	87.6%	55,6%	97.6%
Taking it by the crown, wash it with saline solution without scraping the root.	63,4%	75%	55,6%	97.6%
Taking it by the crown, wash it with running water.	88,8%	90.9%	100%	100%

For the items wash it with a toothbrush and wash it with running water, the results of incorrect answers were 12.4% and 9.1% respectively. 97.6% of the coaches gave correct answers to this question and 2.4% answered incorrectly, these last answers are located in

the section wash it with a toothbrush, results that coincide with those obtained by Escobedo (2019) who also found a high percentage of these responses.

With respect to the previously analyzed period from September 2014 to June 2015, in this study it can be seen that there has been a gain in information management on the subject, especially by the coaches, which does not infer that said knowledge is put into practice. practice in the face of dental trauma, so it is pertinent that educational actions continue to be applied to adequately treat traumatic injuries to the teeth of athletes.

Conclusions

In the comparison of the effectiveness of educational actions in both studies carried out in the periods (2014-2015 and 2022-2023), it was found that in the latter there was a significant increase in the level of information about the procedure for traumatic injuries in sports. combat in the school category of 14-15 years of the EIDE Provincial of Villa Clara, which indicates that athletes and coaches are better prepared to act in situations of trauma.

The results show that the educational actions have been effective in both athletes and coaches and that preparation has increased over time.

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