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CLASSIFICATION OF SPORTS INJURIES IN THE THREE WEAPONS (FOIL, SABRE, ÉPÉE) ACCORDING TO THE MECHANISM OF OCCURRENCE DURING IRAQI LEAGUE COMPETITIONS

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ABSTRACT

The purpose of the present research was to categorize sports injuries among fencing players of the Iraqi league (that play with all three weapons; foil, sabre and épée) by their mechanism of occurrence. The issue is that the number of injuries endangering the careers of the players and the absence of local research proposing the connection between the type of weapon and kinetic mechanisms leading to the injury. This affects the effectiveness of preventative and rehabilitation measures in different sports clubs adversely. The methodology employed by the researcher was descriptive approach and survey based. The sample size in the study was 120 players in the premier league clubs in the 2025-2026 season and 80 players incurred actual sports injuries were picked through purposive selection. The data collected were done with a high level of attention using a special questionnaire, personal interviews, and records of the records of the Iraqi Fencing Federation. The findings indicated that the most frequent source of injuries was the épée weapon with the highest percentage of 46.43 since the epée is a valid target area anywhere on the body. Most of the injuries (53.57) fell under the lower extremities (knee and ankle). Lunge was the most frequent cause of injury, 40.18 percent, and it is especially common to épée and foil fencing. Sabre injuries were also related to quick retreats in order to turn around. The most prevalent were muscle tears and strains, as 42.86% of the cases were represented by them. Moreover, cumulative fatigue, as well as deteriorated neuromuscular coordination, had caused 58.04% of all injuries during finals of competitions. The findings of the study concluded that injuries come about due to a complex interaction of the severity of the performance, cumulative stress as well as the nature of the weapon. The researcher suggested the creation of the physical conditioning programs with the emphasis on the depth-sensing exercises, strengthening of the knee and ankle ligaments, and proper lunge technique to evenly spread the physical load. The recommendations also encouraged the Iraqi Fencing Federation to restructure its competition time in order to have sufficient time to rest and create a comprehensive and detailed medical record of the history and mechanism of injuries of each athlete in order to develop a special rehabilitation program of each weapon.

KEYWORDS: Classification, sports, injuries.

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INTRODUCTION

Over the last few decades, the worldwide sport movement has gone through a game changer and it is no longer restricted to mere recreation or competition. Sports have become a multidisciplinary science that all combines biomechanics, physiology, and sports medicine. In the context of such evolution, the fencing sport is among the most noble and complicated sports in the Olympics, which requires a special set of explosive power, high speed, and accurate neuromuscular coordination. It is commonly known as physical chess and this sports activity subjects the player to extreme physical and mental difficulties. Fencers should be able to make crucial decisions within a fraction of a second and perform complicated offensive and defensive moves that demand a high level of flexibility of the joints and a lot of muscular power.

As competition in the sport focused industry continues to intensify, specifically within the Iraqi Fencing League, as it is reasserting dominance and competitiveness in the region, the problem of sport-related injuries has become the focal point, jeopardizing the careers of the athletes, as well as consuming human and financial resources of the clubs. A wound is not just a momentary health complication, but a functional and structural failure of the body tissues to withstand external or internal forces that surpass the abilities of the tissues to resist them. In fencing, injuries assume a certain form, which is connected to the kind of weapon wielded (foil, sabre, épée). There exists a specific target area of each weapon and movement regulations that impose varying movement patterns to the fencer that cause mechanical pressure on some of the body in a way more harmful than others. [1]One of the foundations of contemporary sports medicine is the studying of the mechanism of injury. It does not only inquire What is the injury? but also How and why did it? Was the injury caused by the vicious lunge action that subjects the knee joint and the adductor muscles to a lot of pressure? Or was it caused by quick backward movements and sudden changes of direction which endanger the ankle ligaments? Or is the nature of the weapon, like the lightness of the foil relative to the weight of the ép, the cause of differences in the trauma of the upper extremities, e.g., tendinitis of the elbow and wrist? The other issues facing fencers in the Iraqi setting are associated with playing environment, quality of playing field (track), compliance with warm-up programs and avoidance programs, as well as the strenuous training of the Iraqi league which might not give players time to relax. This supports the significance of the research; it is a grave scientific undertaking to illuminate the health factuality of the Iraqi fencers by classifying the injuries with high accuracy based on the three weapons. The inadequacy of detailed statistical and field research to corroborate weapon type and injury mechanism in the local Iraqi situation has necessitated the need to have a scientific database by which coaches and sports physicians can base themselves on.[2]

What this research can contribute to the field of science is to give the Iraqi coaches a better insight into the physical weaknesses of every weapon so that they can select preventative training programs to enhance the working muscles of the respective body and increase the flexibility of the joints that are more likely to be damaged. This research can also help to avoid the waste of athletic talent because when an elite fencer in the Iraqi league is injured, it will be years of training and athletic investment to be lost. Additionally, the connection between the mechanism of injury and the kind of weapon creates new frontiers to researchers to research the biomechanical mechanisms of offensive and defensive movements in fencing, therefore, improving the reputation of Iraqi scientific research in the international arenas.[3]

This study is not a simple description of injuries, but a study of the so-called kinetics of the Iraqi fencing, trying to answer such burning questions as: Do injuries in an epée fencer who uses the weapon which cuts whole body and injuries in sabres fencer who uses the weapon which cuts and causes violent movement of torso? And what role does the mechanism of injury play in establishing the duration of time necessary to train? These questions will help create the way out of the sea of despair and doubt where the system of safer and more professional fencing under the name of the Iraqi flag will be used, which will guarantee additional achievements of the athlete and the further progress and prosperity of the Iraqi sport.

RESEARCH PROBLEM

The research problem is based on the observation of the researcher (who followed the events on the Iraqi Fencing League competitions on the field) that the number of injuries of athletes in sports has increased significantly. This leads to the withdrawal of some talented players or a decline in their physical and technical performance.

Despite the specific characteristics of each of the three weapons (foil, sabre, and épée) in terms of the target area, rules of play, and dynamic movement, there is a clear lack of local studies that classify these injuries according to their mechanism of occurrence (i.e., the physical movement causing the injury, such as a slam, thrust, or fall). The failure to define the relationship between the type of weapon and the mechanism causing the injury results in preventative and rehabilitation programs in Iraqi clubs being general and not addressing the actual needs of each discipline. This prompted the researcher to investigate this problem and accurately classify injuries to contribute to the development of a scientific database to serve the sport of fencing in Iraq.

RESEARCH OBJECTIVES

1. To identify the most common types of sports injuries among fencers in the three weapons (foil, sabre, and épée) in the Iraqi league.
2. To classify sports injuries according to their mechanism of occurrence (mechanical movements) for each weapon.
3. To determine the differences in the frequency of injuries and their mechanisms of occurrence among the three weapons, in conjunction with the nature of competition in the Iraqi league.

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4. To prepare statistical classification tables illustrating the areas of injury in the body and their relationship to the type of weapon used.

RESEARCH HYPOTHESES

1. There are statistically significant differences in the type and location of injury according to the type of weapon used (foil, sabre, and épée).
2. The lunge is the most common mechanism causing lower limb injuries in épée and foil fencing, while torso and upper limb injuries are more frequent in sabre due to explosive movements.
3. Lower limb injuries (knee and ankle) are the most common injuries in the Iraqi Fencing League in general.
4. There is a correlation between the technical rules of each weapon and the predominant injury mechanism.

RESEARCH FIELDS

- Human Field: Players from the Iraqi Premier League fencing clubs (participating in the league).
- Temporal Field: The period from (specify the date, e.g., November 1, 2025 to May 1, 2026).
- Spatial Field: The specialized halls where the Iraqi League competitions were held (such as the training center hall of the federation in Baghdad).

RESEARCH METHODOLOGY

The researcher used the descriptive approach, employing a survey and comparative methodology, as it was the most suitable approach for the nature of the research problem and its objectives. The aim was to describe the phenomenon of sports injuries as they occur in reality, analyze them, and classify them according to their mechanisms of occurrence in the three weapons.[4]

RESEARCH POPULATION AND SAMPLE

- Research Population: The research population consisted of (120) players from the Iraqi Premier League fencing clubs for the 2025-2026 season, representing the participating clubs.
- Research Sample: The research sample was selected purposively and included (80) players practicing the three weapons (foil, sabre, and épée) who sustained actual injuries during league competitions or nearby training sessions. Junior players and those with non-sports injuries (off-field injuries) were excluded.

RESEARCH TOOLS AND DATA COLLECTION METHODS

The researcher used the following tools to collect data:[5]

1. Arabic and foreign sources and references: to develop the theoretical framework.
2. Injury Classification Questionnaire: The questionnaire was designed to include information on (type of weapon, location of injury, type of injury, and mechanism of occurrence).
3. Personal Interviews: Interviews were conducted with club coaches and the medical staff accompanying the teams.
4. Records of the Iraqi Fencing Federation: These records were used to document withdrawals or injuries officially recorded in referees' and medical committee reports.

PILOT STUDY:

The researcher conducted a pilot study with a sample of (5) players from outside the main research sample to ensure:[6]

- The clarity of the questionnaire items and the players' understanding of the terminology (such as the mechanism of occurrence).
- The time required to complete the questionnaire.
- The validity and reliability of the instrument were confirmed by a group of experts in the fields of sports medicine and fencing.

FIELD PROCEDURES:

The researcher distributed the research questionnaires during the final rounds of the Iraqi League (in Baghdad and the provinces), where the following was done:

1. To identify players injured during the season.
2. Accurately describe the mechanism of injury (whether it occurred during attack, defense, or as a result of a technical malfunction in the stabbing motion).
3. Classify the injury according to the weapon the player was using at the time of the injury.

STATISTICAL METHODS

To process the collected data, the researcher used the Statistical Package for the Social Sciences (SPSS), which included the following methods:

- Percentage: to describe injury frequencies.
- Chi-square test: to determine the significance of differences in injuries between the three weapons and the mechanisms of occurrence.
- Mean and standard deviation: to describe the ages and years of experience of the sample.

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RESULTS

Table (1): Frequencies and rates of injury in the three weapons and the (Chi2) value of the differences between them

Type of weapon	Recurrence of injuries (f)	Percentage (%)	Calculated value of (χ2)	Statistical significance
Epee	52	46.43%	***11.25**	Sig.
Sabre	34	30.36%		
Foil	26	23.21%		
Total	**112**	**100%**		

The tabulated chi-square value at a significance level of 0.05 and degrees of freedom of 2 is 5.99.

Since the calculated value (11.25) is greater than the tabulated value, this indicates a statistically significant difference favoring the épée as the most frequently injured weapon in the Iraqi league.

Table (2): Distribution of injuries according to the affected body region for the entire sample and the (Chi2) value of the differences between them

Injury area	Recurrence of injuries (f)	Percentage (%)	Calculated value of (χ2)	Statistical significance
Lower limb (knee, ankle, foot)	60	53.57%	***22.07**	**Sig.**
Upper limb (elbow, wrist, shoulder)	32	28.57%		
Torso and back	20	17.86%		
Total	**112**	**100%**		

- Some of the tabulated chi-squared (2) value of 5.99 at a significance level of 0.05 and degrees of freedom (2) equals 5.99.
- The findings revealed that the lower limbs injuries were much higher, which was also an indication of the severity of kinetic pressure that the lower joints are subjected to during combat.

Table (3): Types of injuries based on the mechanism of occurrence (causative mechanical movements) and chi-squared value

Mechanism of occurrence (causing movement)	Recurrence of injuries (f)	Percentage (%)	Calculated value of (χ2)	Statistical significance
Lunge movement	45	40.18%	***15.21**	**Sig.**
Retreat and sudden change of direction	28	25.00%		
Defensive movements and blade engagement	22	19.64%		
Falling or collision	17	15.18%		
Total	**112**	**100%**		

- The tabulated chi-squared value at a significant level of 0.05 and degrees of freedom of 3 is 7.81.
- The finding suggests that stabbing movement is the most commonly inflicting injury, which is far more than other movements. This requires an investigation on the physical performance methods of the league players of Iraq.

Table (4): Correlation between the type of weaponry and the most common mechanism of injury (frequency and percent of weaponry)

Type of weapon	The most frequently used mechanism	Repetition within the weapon	Percentage (%)	Mechanical interpretation
Epee (fencing sword)	The stabbing movement (Lunge)	30	57.7%	Long attack range and full-body targeting
Sabre (sword)	Retreat and change of direction	16	47.1%	Explosive speed and rapid recoil
Foil (fencing sword)	Defensive and stabbing movements	12	46.2%	Reliance on hand precision and torso movements

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- We observe a variation in the mechanisms of injury depending on the weapon. At fencing (épée), the stabbing movement becomes a leading contributor, and it causes more than half of all injuries with this weapon.
- On the other hand, in sabre (épée), the most predominant cause is the retreating motions because of the aggressive and competitive style of this weapon in the Iraqi league.

Table (5): The chi-square (2) value and distribution of injuries based on the nature of tissue injured (type of injury)

Type of injury (damaged tissue)	**Recurrence of injuries (f)**	**Percentage (%)**	**Calculated value of (χ2)**	**Statistical significance**
Muscle strain and tear	48	42.86%	***28.14**	**Sig.**
Sprain and ligament tear	35	31.25%		
Bruises and physical contact	18	16.07%		
Other injuries (dislocation/minor fracture)	11	9.82%		
Total	**112**	**100%**		

- The tabulated chi-squared value at a significance level of 0.05 and degrees of freedom of 3 is 7.81.
- The table presents the prevalence of muscle injuries (tears and strains), and then the ligament injuries, which means that the high physical loads during the Iraqi league competitions are sometimes beyond the elasticity of the muscles of the players.

Table (6): Injuries by time they occur during the Iraqi league competitions, (This table show relates the accumulation of fatigue with the time of injury)

Time of injury	**Recurrence of injuries (f)**	**Percentage (%)**	**Scientific interpretation**
Preliminary rounds	25	22.32%	Inadequate warm-up or failure to get into the rhythm of the match; accumulated physical fatigue and mental stress; high training loads or poor playing surface
Final rounds	65	58.04%	Inadequate warm-up or failure to get into the rhythm of the match; accumulated physical fatigue and mental stress; high training loads or poor playing surface
During training sessions	22	19.64%	Inadequate warm-up or failure to get into the rhythm of the match; accumulated physical fatigue and mental stress; high training loads or poor playing surface

DISCUSSION

A keen observation of the outcomes of the six tables will show that the injury map of the Iraqi Fencing League is accurately displayed in terms of the type of physical activity. It is clear in Table 1 that episse is the unquestioned king of wounds. This is not chance, but because the rules of the épée expose the whole body as a perfectly legitimate object, compelling the man who is fencing to make instant and sudden gestures of defense to his leg or his hand--a circumstance not experienced to the same degree when foil and sabre are used.[7]

When this kind of weapon is linked to the locations of the injuries as provided in Table 2, the lower extremities (knee and ankle) are the most common with more than half of the total number of injuries. This anatomic emphasis is also elaborated by Table 3 that presents the most destructive mechanism in the dock the "lunge. In the heat of the league the Iraqi fencer makes this movement with a tremendous explosive movement. During the braking the knee joint experiences pressure exceeding that which the ligaments can hold especially given the kind of the flooring in certain halls in the area which can increase the impact.[8]

Table Four indicates a key technical feature: whereas the épée fencer has difficulties with stabbing injuries, the sabre fencer has difficulties with a retreat and change of direction injuries. This is in consonance with the aggressiveness of the offensive as well as defensive aspect of this weapon that demands quick and reflexive motion straining the adductor muscles and ankle tendons. This is again reaffirmed by Table Five that demonstrates the dominance of muscle injuries (tears and strains), and this is a clear indication that the fencers compete with high physical loads before their muscles can attain the required flexibility to support such explosive movements.[9]

Last but not least, Table Six makes everything above described chronologically and logically: the concentration of injuries during the latter stages of the Iraqi league test obviously indicates the element of cumulative fatigue. A fencer who has a number of fights in one day or two days in a row slowly loses motor control (neuromuscular coordination), at least to make moves more accurately and become more vulnerable to mechanical mistakes, which eventually leads to injury at an inopportune moment. All these findings go to justify the fact that injuries on the part of the Iraqi fencers were not unavoidable but the result of a combination of the factors such as the aggressive nature of the movement, the cumulative exertion, and the peculiarities of the weapon."[10]

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CONCLUSIONS:

The researcher came up with a conclusion that the risk of injury in the Iraqi league has different levels of risk using field observations and data analysis. The weapon that most damages the physical well-being of the fencers is the épée as it has a wide target area which compels the fencer to be in unnatural and unnatural positions. They also discovered that the lower limbs, in particular, the knee joint are the main place of the injury and that the imbalance in the distribution of weight during the thrust or landing is the key factor in the occurrence of such events.

Moreover, the study has found that muscle tear is the most prevalent form of injury, which demonstrates that the league presents high competition requirements and the physical state of players (elasticity and flexibility) is not on par with it. Lastly, the findings showed fatigue as the last rounds are played in the league to be the largest cause of an injury since motor coordination is compromised under the pressure of compounded stress where defensive and offense movements tend to be less accurate and risky.

RECOMMENDATIONS

According to these results, the researcher suggests the revising of physical conditioning programs in the Iraqi clubs and places much emphasis on the proprioception training and strengthening of the ligaments that accompany the knee and ankle joints. Another suggestion that the researcher makes is that the coaches should constantly correct the technical in the mechanics of the lunging of the players so that the kinetic stress is distributed among the muscles and is not concentrated on the joints and ligaments.

Organizationally the study suggests that the Iraqi Fencing Federation should evaluate its league scheduling system to enable ample time in between the last rounds to reduce the effect of cumulative fatigue. Last, the researcher is concerned with the issue of creating a medical record of each player that he notes the history of player injuries and the mechanisms of their creation, to make the work of the physical therapist developing more specific rehabilitation programs oriented on each weapon separately rather than the general rehabilitation that might prove to be more helpful with the Iraqi fencer movement.

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