

# MUSCULOSKELETAL INJURIES IN WRESTLING ATHLETES

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## ABSTRACT

**Objective:** The present study aimed to retrospectively evaluate musculoskeletal injuries in elite Brazilian wrestlers. **Methods:** Ninety-five wrestlers completed a structured questionnaire to assess wrestling injury history and clinical and demographic data. **Results:** Eighty one athletes (85,3%) informed 145 lesions. The most commonly injured body regions were knee (25,5%), shoulder (20%), thigh (15,2%) and ankle (14,5%). Sprains

(34,5%) and muscle lesions (30,4%) were the most common injuries. Surgical treatment was performed in 9% of the lesions and the majority of these lesions (61,5%) were located in the lower limbs. **Conclusions:** Musculoskeletal lesions are common in wrestling athletes and the lower limbs are the most frequently injured site.

**Keywords:** Athletic injuries. Wrestling. Epidemiology. Orthopedics.

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## INTRODUCTION

Practiced since ancient times, wrestling is the most natural method of attack and defense of the human race, and over the years has become a sport, having been one of the categories of contests at the first Olympic games in 776 B.C.<sup>1,2</sup>

Today there are two styles of wrestling: Greco-Roman, which made its debut in the first modern Olympics in Athens (1896), and freestyle, included in the Olympic program in Saint Louis (1904). The objective of the two styles is to immobilize the opponent on their back.<sup>2</sup>

In Brazil, interest in the sport has increased in recent years. Approximately 1,200 wrestlers registered with 17 state wrestling federations regularly compete in championships.<sup>3</sup>

Wrestling is a contact sport with extreme physical demands and its practice is naturally associated with an elevated incidence of orthopedic injuries,<sup>1,4-6</sup> yet there is little information about these injuries in literature.<sup>4,5</sup>

The aim of this study was to identify and characterize the musculoskeletal injuries more commonly related with the sport. The analysis of the data obtained can assist in the preparation of preventive measures.

## MATERIAL AND METHODS

The sample was composed of 95 elite wrestlers. The information was gathered by means of a structured questionnaire completed by the athletes during the Brazilian wrestling championship held in March 2007. All the wrestlers were assisted by the same researcher in completing the questionnaire. This questionnaire contained data relating to age, gender, time sport has been practiced, topography and diagnosis of all the musculoskeletal injuries occurring during the practice of the sport, treatment applied and time required to resume training. The mean age of the interviewees was 23.6 years (ranging from sixteen to forty-two years.). With regard to gender, 65 (68.4%) were male and 30 (31.6%) female. The mean time of practice of the sport was 43.1 months, with minimum of six and maximum of 120 months. (Table 1)

Sports injury was defined as a condition that limits function prompting the wrestler to seek the help of professionals from the area of health or that causes abandonment of a fight or of training, according to the criteria of NAIRS (National Athletic Injury Reporting System)<sup>7</sup> and of McLennan and McLennan.<sup>8</sup> According to the modification of the study by Brynnhildsen *et al.*<sup>9</sup> proposed by Cohen *et al.*<sup>10</sup>, the injuries were divided into

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Table 1. Characteristics of the 95 athletes evaluated

Characteristic	Value
Male Gender (%)	65 (68.4%)
Female Gender (%)	30 (31.6%)
Age	23.6 (16 – 42) years
Time practicing the sport	43.1 (6 – 120) months
Injuries reported	145
Athletes reporting injuries (%) One injury Two injuries Three injuries	81 (85.3%) 28 42 11
Average length of absence due to injury	2.1 (0.5 – 9) months
Injuries treated surgically (%)	13 (9%)

contusions, fractures, dislocations, sprains, muscle lesions and tendonitis and, in terms of location, were grouped by segment in lower limbs (thigh, knee, leg, ankle and foot), upper limbs (shoulder, arm, elbow, forearm, wrist and hand) and trunk.

The study was approved by the Institution Review Board of Santa Casa de Misericórdia de São Paulo.

The data analysis was performed quantitatively by means of descriptive statistics.

### RESULTS

Injuries resulting from wrestling were reported in 81 (85.3%) of the 95 athletes assessed, occurring in 58 (89.2%) of the 65 men and in 23 (76.7%) of the 30 women.

In all, 145 injuries were reported in 81 athletes, with 53 (65.4%) wrestlers having suffered two or three injuries. Only 14 athletes did not refer to injuries resulting from wrestling.

As regards the topography of the injuries, 88 (61%) occurred in the lower limbs, 42 (29%) in the upper limbs and 15 (10%) in the trunk. (Figure 1)

The knee (25.5%), shoulder (20%), thigh (15.2%) and ankle (14.5%) were the most frequently affected anatomical regions. (Figure 2)

In relation to diagnosis, we encountered greater frequency of sprains (34.5%), followed by muscle lesions (30.4%), tendonitis (14.5%), dislocations (10.3%), fractures (6.2%) and, finally, contusions (4.1%). (Figure 3)

Surgical treatment was necessary in 13 (9%) injuries and the majority of these injuries (61.5%) were located in the knee. (Figure 4)

Taking into account the total number of injuries, the average length of abstention of sports activities due to each one of them was 2.1 months. The average length of abstention due to the injuries treated conservatively was 1.6 months, while the average length due to injuries treated surgically was seven months.

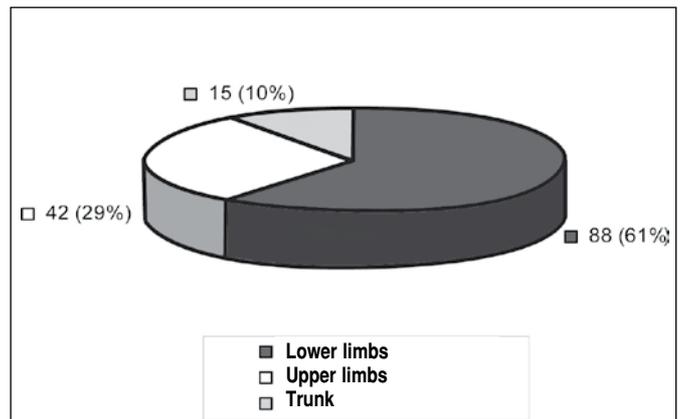


Figure 1. Distribution of the frequency of injuries according to the segment affected.

### DISCUSSION

There is a large number of wrestlers in the world, and although not widely publicized in Brazil, the number of individuals interested in the sport has presented a significant increase in recent years.<sup>3</sup> National medical literature lacks studies on orthopedic injuries in this sport and our goal was to conduct an epidemiological investigation into such injuries and to compare it with data from international literature.

It is interesting to observe that in this retrospective study, 85.3% of the athletes referred to musculoskeletal injuries resulting from wrestling in their careers, and all the wrestlers that had not suffered injuries had been practicing the sport for less than 24 months, which suggests that longer length of practice and, consequently, higher number of exposures, is associated with the greater occurrence of injuries. Previous studies with different definitions of sports injury and design also document high rates of injuries associated with the sport. Estwanik *et al.*<sup>11</sup> studied the injuries that occurred during American Olympic trials and reported injuries in 26.5 % of the competitors. Snook<sup>6</sup> kept track of 129 wrestlers for five years and, in this period, observed 90 injuries in 70 athletes. Jarrett *et al.*,<sup>4</sup> through the analysis of a database on injuries in university athletes over an 11-year period, determined the incidence of 9.6 injuries for every 1,000 exposures of the athletes, which places wrestling second in the ranking of sports with the largest number of injuries, only coming second to American football. We believe that the higher percentage of lesions is due to the extreme physical demands inherent to an individual combat sport.<sup>2,12</sup> In our study, we do not distinguish between injuries occurring during training and competitions. Agel *et al.*<sup>1</sup> and Jarrett *et al.*<sup>4</sup> demonstrated that most traumas occur during training, but the incidence of lesions caused by exposure is about four times greater during competitions.

Several anatomical regions are injured as a result of the practice of wrestling.<sup>4,11</sup> We found that the topography with the highest number of lesions was the knee (25.5%), followed by the shoulder (20%), which is consistent with the findings of most researchers.<sup>1,4,6,12,13</sup> Only Pasque and Hewett<sup>5</sup>, in a prospective study with adolescent athletes for a season, found a

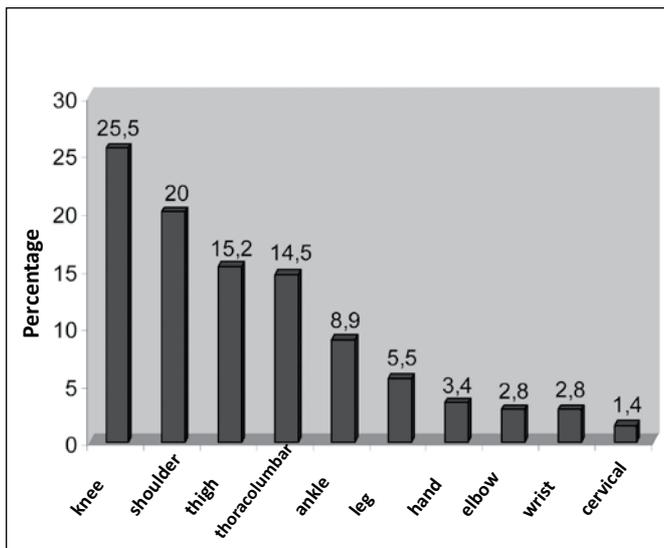


Figure 2. Distribution of the frequency of lesions according to the anatomical region

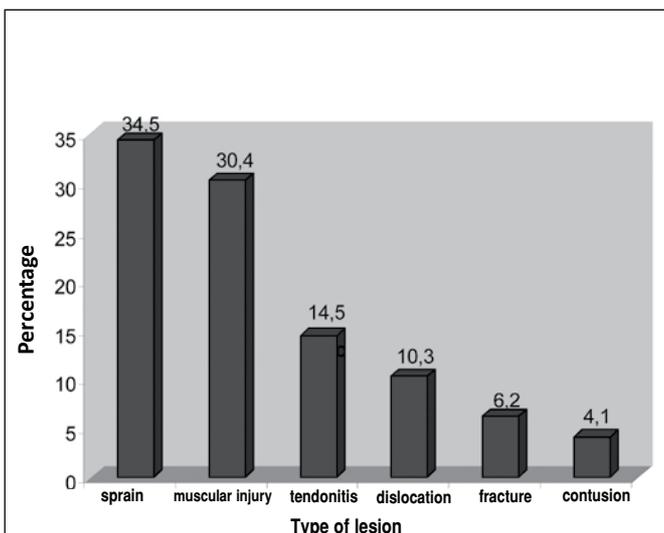


Figure 3. Distribution of the frequency of lesions according to the diagnosis.

larger number of musculoskeletal lesions in the shoulder (24%) and, in second place, in the knee (17%).

Another aspect addressed was the most frequent types of lesion. The difficulty in the comparison of data among studies is due to the absence of an uniform standard in the classification of lesion types.<sup>4</sup> The types of lesion most frequently reported in our study were sprains (34.5%) and muscle lesions (30.4%), which is in line with the results presented by Jarrett *et al.*<sup>4</sup>, Pasque *et al.*<sup>5</sup> and Snook<sup>6</sup>. These authors said that contusions are the third most common lesion in wrestlers, unlike our data in which contusions were the least frequent lesions. The retrospective nature of the data gathering based on interviews may justify this discrepancy, since contusions, which are generally lesions of lesser morbidity and shorter length of absence from sport, may have been underreported in our survey.

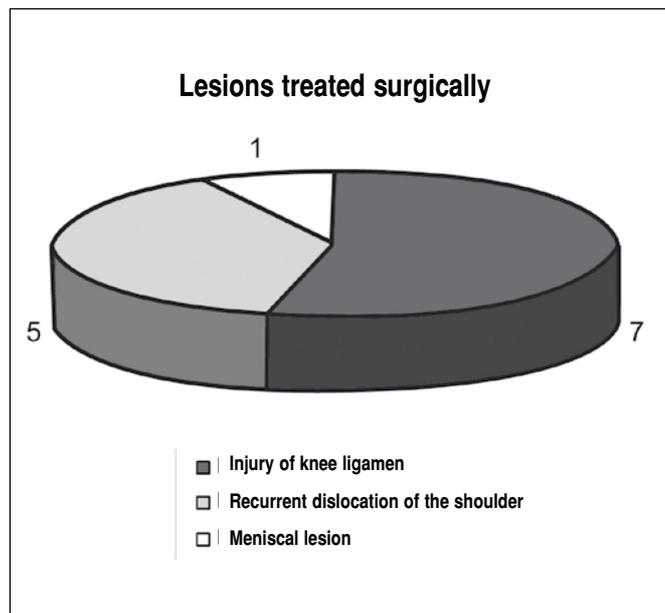


Figure 4. Distribution of the 13 surgically treated injuries.

There are no universally accepted criteria for evaluation of the severity of sports injuries.<sup>4,13</sup> We used the need for surgical treatment as a severity parameter. In our study, 13 (9%) lesions were operated and most of these lesions were located in the knee. In a similar manner, Jarrett *et al.*<sup>4</sup> said that 6% of the lesions required surgical treatment and Agel *et al.*<sup>1</sup> and Wroble *et al.*<sup>14</sup> reported that most of the lesions that required surgical treatment occurred in the knee. Several authors<sup>4-6,12,15</sup>, using different methods to evaluate severity, report that the majority of traumatism in wrestlers are not considered severe.

In our study, the average length of absence from sport due to injury was 2.1 months. This time was considerably longer than that encountered by other authors.<sup>1,4,5</sup> This may be a result of the design of our study, in which injuries of lesser severity with shorter length of absence were probably not reported due to a known effect such as memory bias.

Knowledge of the more frequent musculoskeletal injuries in wrestlers can help professionals involved in the sport in the preparation of preventive actions and of training programs with the intention of reducing their incidence and of improving the performance of sportsmen and sportswomen.

## CONCLUSIONS

Most of the athletes (85.3%) related at least one injury resulting from wrestling.

The lower limbs were the anatomical segment with the highest number of injuries.

The anatomical regions most affected were the knee, the shoulder, the thigh and the ankle.

The diagnoses most frequently reported were strains and muscle lesions.

Surgical treatment was necessary in 9% of the lesions, of which the majority was located in the knee.

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