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ORIGINAL ARTICLE

Injuries in martial arts and combat sports: Prevalence, characteristics and mechanisms

*Blessures dans les arts martiaux et les sports de combat :
prévalence, caractéristiques et mécanismes*

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Summary

Objective. – To measure sports injuries prevalence, types and mechanisms, considering grappling and impact modalities.

Equipment and methods. – An observational, descriptive epidemiology study was conducted involving 125 recreational practitioners. Subjects were inquired regarding the type of martial arts and combat sports (MACS), age, practice time and weekly training volume.

Results. – From all, 53.6% athletes suffered injury in the last 12 months. The most common were tendon injuries (39%) and sprains (39%), followed by dislocation/subluxation (23%). In grappling MACS, as Judo, joints injuries were the most frequent, especially the knees and shoulders. For striking modalities, such as Karate, muscle injuries were more frequent and the most common sites were feet and toes, followed by hands and fingers. The lower limbs were the most affected site ($\chi^2 = 67.8$, $P < 0.001$). A higher prevalence of injury was found in combat simulations (43%) than in technical training (26%) and competition (10%).

Conclusion. – There was a high percentage of injury in lower limbs for both modality groups, and the higher frequency of injuries in the upper limbs were the shoulders, hands and fingers, while for lower limbs were the feet and toes, ankles and knees. Injury occurred mainly during technical training and, in most cases, without protective equipment.

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MOTS CLÉS

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Blessures ;
Statistiques et
données numériques ;
Sportifs ;
Médecine du sport

Résumé

Objectif. – Cette étude a été conçue pour mesurer la prévalence, les types et les mécanismes des lésions entraînées par la pratique des arts martiaux, compte tenu des modalités de grappling et d'impact.

Matériel et méthodes. – Une étude épidémiologique observationnelle et descriptive a été réalisée sur 125 sportifs amateurs. Ils ont été interrogés sur le type d'arts martiaux ou de sports de combat, l'âge, le temps de pratique et le volume d'entraînement hebdomadaire.

Résultats. – Parmi tous les participants, 53,6 % ont été blessés au cours des 12 derniers mois. Les blessures les plus courantes étaient les blessures aux tendons (39 %) et les entorses (39 %), suivies de la luxation/subluxation (23 %). Dans les sports de combat avec *grappling*, comme le Judo, les blessures articulaires étaient les plus fréquentes, en particulier aux genoux et aux épaules. Pour les sports de combat avec impact, comme le karaté, les blessures musculaires étaient plus fréquentes et les sites les plus communs étaient les pieds et les orteils, suivis par les mains et les doigts. Les membres inférieurs étaient le site le plus affecté ($\text{Chi}^2 = 67,8, p < 0,001$). Une prévalence plus élevée de blessures a été trouvée dans les simulations de combat (43 %) que dans l'entraînement technique (26 %) et la compétition (10 %).

Conclusion. – Il y avait un pourcentage élevé de blessures des membres inférieurs dans les deux groupes de modalités, et les blessures aux membres supérieurs affectaient préférentiellement les épaules, les mains et les doigts. Aux membres inférieurs les blessures prédominaient aux pieds et aux orteils, aux chevilles et aux genoux. Les blessures survenaient principalement lors de l'entraînement technique et, dans la plupart des cas, en l'absence d'équipement de protection.

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1. Introduction

In martial arts and combat sports (MACS) universe, we highlighted two wide groups of modalities: grappling modalities, which involve projections/throws, immobilisations, joint locks and struggles, and impact modalities, which involve punches, kicks, elbows and knee blows [1]. In grappling modalities, a higher percentage of injury occurs in joints, and upper limbs are the most vulnerable site [2]. However, recently, a higher prevalence of injury was shown in knees, mainly due to successive movements to body rotation and the blocking process of projection techniques [3]. In impact MACS, a higher prevalence of injury was shown in lower limbs [4]. Indeed, it should be considered that there is a reasonable difference in injury patterns among beginners and experienced athletes, with the first tending to injure the trunk more frequently and the latter suffering injuries in the head more often [5]. Muscle tissue is the most vulnerable site in impact MACS, followed by joint sprains and fractures [4,5], but while even considering systematic review researches about injuries in different MACS [6], to date, we found no studies comparing injury patterns among MACS athletes from grappling or impact modalities.

Assuming that, MACS are substantially different concerning the movement pattern [6], there may be preferential distribution of injury when considering the group of practices, although this has not been investigated previously in the same study. In addition, a better understanding of the injury characteristics, such as type, timing and severity, can contribute to the development of preventive actions, intended to reduce the incidence or severity [6,7]. Thus, this study aimed to measure injury prevalence, types and mechanisms, considering that there may possibly be differences between grappling and impact modalities.

2. Material and methods

2.1. Study design and variables

It was an observational, descriptive epidemiology study, which involved athletes from different MACS, as Taekwondo, Shotokan Karate, Contact Karate, Wushu, Boxing, Hapkido, Muay Thai, Jiu Jitsu, Aikido and Judo. Independent variables were as follows: type (grappling or striking), age (between 18 and 25 years, 26–35 years, and above 36 years), body mass index (BMI), practice time (until four years or more than four years), non-competitive activities and weekly training hours. Dependent variables included frequency, type, moment of injury, anatomical site, severity, and recovery time.

2.2. Subjects

The reference population for this study consisted of MACS adult athletes from Pelotas/RS, Brazil. To obtain the sample size, previous efforts to contact the Regional Council of Physical Education and the Physical Education Professionals Association found that in the city there is no numerical record of practitioners in gym clubs or associations. Still, while a licence for professional practice is necessary, many places do not have it. Thus, the number and name of gym clubs and associations offering MACS practices were registered ($n = 50$). They were visited and male practitioners who were 18 years old or above, and who agreed to participate in the present study, were involved. Those with less than three consecutive months of practice ($n = 65$) and competitors from other sports were excluded. The final sample consisted of 125 subjects who were described from body mass, height,

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