



Original article



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Pain profile and kinesiophobia in judo athletes of the master category

Perfil de dor e cinesiofobia em atletas de judô da categoria master

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ABSTRACT | INTRODUCTION: Contact athletes are subject to musculoskeletal injuries due to repetitive techniques applied during training and championships. This can lead to acute and chronic pain, and depending on the technique applied, different regions of the body may be affected. Studies in this area focus on the description of injury or trauma, however, the presence of kinesiophobia in this population is a gap to be investigated. **OBJECTIVE:** To describe the profile of pain and kinesiophobia in judo athletes of the master category. **METHOD:** An observational, descriptive, cross-sectional study conducted with 29 judo master athletes enrolled in the Bahia Federation. For pain description, the Brief Pain Inventory (BPI) and Doleur Neuropathique Questionnaire (DN4) and the Tampa Scale for Kinesiophobia (TSK) were used. The data were tabulated and analyzed descriptively through the software Excel for Windows® using absolute or mean value (standard deviation). **RESULTS:** The BPI data showed that the overall pain mean was 5.1 ± 1.8 , the treatment chosen was mostly pharmacological and the region most affected was the anterior knee. Of the 29 participants, 9 (31%) had score 3, indicating the presence of neuropathic pain and mild kinesiophobia with an overall mean of 33.8 ± 6.7 on the TSK score. **FINAL CONSIDERATIONS:** The athletes presented moderate pain with little impact on personal life and the regions with the highest incidence were the knees. Mild kinesiophobia was present in more than half of the participants and one third presented neuropathic pain.

KEYWORDS: Pain. Kinesiophobia. Martial Arts.

RESUMO | INTRODUÇÃO: Atletas de contato estão sujeitos a lesões musculoesqueléticas devido às técnicas repetitivas aplicadas durante treinos e campeonatos. Isso pode levá-los a apresentar dores agudas e crônicas, e, a depender da técnica aplicada, diferentes regiões do corpo podem ser acometidas. Estudos nesta área focam na descrição da lesão ou trauma, no entanto, a presença de cinesiofobia nesta população é uma lacuna a ser investigada. **OBJETIVO:** Descrever o perfil de dor e cinesiofobia em atletas de Judô da categoria master. **MÉTODO:** Estudo observacional, descritivo, de corte transversal, realizado com 29 atletas de judô *master* inscritos na Federação Baiana. Para descrição da dor, foram utilizados o Inventário Breve de Dor (IBD) e *Doleur Neuropathique Questionnaire* (DN4) e a Escala de Cinesiofobia de Tampa (ECT). Os dados foram tabulados e analisados descritivamente através do *software Excel for Windows®* utilizando valor absoluto ou média (desvio padrão). **RESULTADOS:** Os dados do IBD mostraram que a média geral de dor foi de $5,1 \pm 1,8$, o tratamento optado foi majoritariamente o farmacológico e a região mais acometida foi a face anterior do joelho. Dos 29 participantes, 9 (31%) apresentavam o escore ≥ 3 , indicando presença de dor neuropática e cinesiofobia leve com média geral de $33,8 \pm 6,7$ no escore da ECT. **CONSIDERAÇÕES FINAIS:** Os atletas apresentaram dor moderada com pouco impacto na vida pessoal e as regiões com maior incidência foram os joelhos. Cinesiofobia leve esteve presente em mais da metade dos participantes e um terço apresentou dor neuropática.

PALAVRAS-CHAVE: Dor. Cinesiofobia. Artes Marciais.

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Introduction

The practice of contact sports predisposes musculoskeletal injuries and is no different in martial arts. In addition, these injuries may be due to direct mechanical shock between athletes, or musculoskeletal injuries by stretching (10% to 55% of muscle injuries occur during sports).¹ Acute traumatic injury in the athlete can be accompanied by fear, anxiety and greater cognitive focus on injury.²

Comparing athletes with non-athletes, the first group presents a greater tolerance and a less exacerbated response to pain than the second group.^{3,4} The types of injuries are varied and issues such as "overtraining" (excessive training), which are important factors in the origin of painful phenomena.⁵ Contact athletes, such as judokas, tolerate pain more, however, factors such as personality and emotional aspects can alter how the person deals with the painful phenomenon.⁴

In judo, the practice and application of techniques are a causal factor of injury and sometimes pain. Throwing techniques or threatening to throw the opponent to the ground show high injury rates⁶, and the most affected sites are knees (23%), shoulders (16%) and ankles (14%) followed by others such as toes and hands.⁷

The technique applied at the time of injury is an important factor because each one has a specific biomechanics and, therefore, a different mechanism of injury.^{5,7} In judo, the movements involve falls, twists and immobilizations, favoring joint injuries by trauma. Male gender and weekly training hours are also predisposing factors for the appearance of injuries.⁸

Neuropathic pain has an incidence of 6-8% in the general population and may be more intense when compared to non-neuropathic types.⁹ In kinesiophobia, we have a condition of fear when performing a movement that can result in dysfunction,

disuse and psychological disorders, since the person feels incapable and little autonomous, limiting their activities.¹⁰

In this context, there is a predominance of studies focusing on injury, trauma and/or nociceptive pain in contact athletes¹¹ and it is necessary to understand the characteristics and types of pain in judo athletes, hoping that these evidences broaden the scope on the clinical management of the painful phenomenon in this population. Therefore, the objective of this study is to delineate the pain profile and the degree of kinesiophobia in judo athletes of the master category.

Material and methods

It is an observational, descriptive, cross-sectional study. Data were collected in the event of the sports calendar of the Bahia Judo Federation in 2016, Salvador, Bahia. Non-probabilistic sample, composed by the accessible population in the event, totaling 29 athletes of both sexes of the master category. The eligibility criteria defined for participation in the research took into account the following inclusion criteria: being a judo athlete registered in the Bahian federation; and exclusion: change in visual acuity that did not allow the reading of the questionnaires at the time of evaluation and these with less than 80% of the completed items.

To delineate the pain profile, athletes were submitted to pain assessment through the Brief Pain Inventory (BPI)¹², the diagnosis of neuropathic pain with the Doleur Neuropatique Questionnaire (DN4)¹³ and the evaluation of kinesiophobia through the Tampa Scale for Kinesiophobia (TSK)¹⁴, which were delivered, printed, to each of the athletes for them to respond. The evaluator guided the participants on the structure and information of the instrument and was available to clarify doubts.

The BPI was designed to investigate the severity and variability of pain, as well as interference in aspects of the individual's life. It is a validated instrument with confirmed psychometric properties to assess the location, pain intensity and interference of pain in sleep, ambulation, interpersonal relationships and work capacity. It uses a scale from 0 to 10, which describes the pain you feel at the moment; the weakest and the worst pain in the last 24 hours, as well as the average pain in this time interval.

DN4 is a questionnaire used to identify neuropathic pain divided into an interview containing 7 questions regarding the presence of neuropathic signs and symptoms and 3 questions associated with physical examination. Sums equal to or greater than 3 are considered indicative of neuropathic pain. In this study, the physical examination was not performed due to the dynamics of the event, and there was no place reserved for them to be applied properly.

The TSK is an instrument used to assess the degree of kinesiophobia of the interviewee. It is a self-administered questionnaire composed of 17 questions that address pain and intensity of symptoms. The scores vary from one to four points, and the answer "totally disagree" equals one point, "partially disagree", two points, "partially agree", three

points and "totally agree", four points. Kinesiophobia was classified as mild (17 to 34 points), moderate (35-50) or severe (51-68).¹⁵

Data were tabulated and analyzed descriptively using the software Excel for Windows, according to sex, using absolute value or mean (standard deviation), which were presented in tables and/or figures. This research is in accordance with resolution 466/12 of the National Health Council of the Ministry of Health (CNS/MS). This was approved under opinion n. 1801294 by the Ethics Committee of the Bahian School of Medicine and Public Health, C.A.A.E. nº 60162916.1.0000.5544. All participants signed the Informed Consent Form (ICF).

Results

A total of 29 athletes participated in this study (Table 1), the majority male, representing 27 participants (93.1%). The average age was 36.1 4.2 years, the training time varied between 2 and 35 years, however, 19 (65.5%) participants reported 20 years or more of judo practice and the majority 24 (83%) of the participants were black belt graduates.

Table 1. Sociodemographic, sports and clinical characteristics of athletes

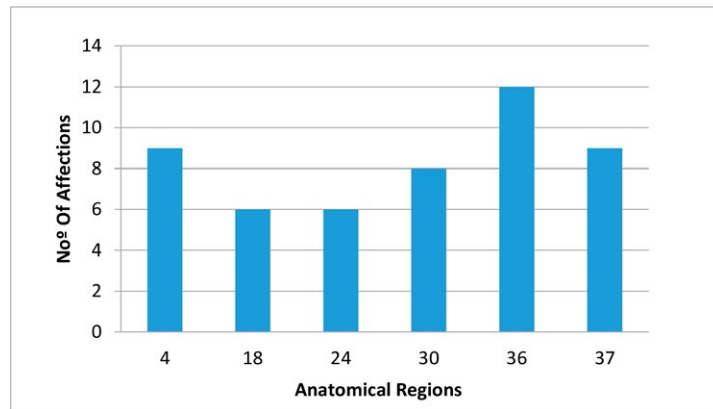
Variables	Total N=29 (100%)
Age (n - %)	
≥ 30 years & < 40	20 (69%)
≥ 40 years	4 (14%)
Uninformed	5 (17%)
Training Time	
< 10 years	2 (7%)
≥ 10 years < 20 years	3 (10%)
≥ 20 years e < 30 years	12 (43%)
≥ 30 years	7 (24%)
Uninformed	5 (17%)
Belt Color	
Orange	2 (7%)
Brown	3 (10%)
Black	24 (83%)
BPI (Mean ± SD)	
Genral Pain	5,1 ± 1,8
Pain at the moment	2,9±2,8
Pain in past 24h	4,5±2,6
BPI (% -Treatments)	
Physiotherapy	4 (14%)
Pharmacological	10 (34%)
Cryotherapy	3 (10%)
Resistance Training	3 (10%)
DN4	
Neuropathic pain (≥3)	9 (31%)
TSK (Mean ± SD)	
Mild	18 (62%)
Moderate	11 (38%)
Severe	-

BPI: Brief Pain Inventory; DN4: Neuropathic pain questionnaire; TSK:Tampa Sacale For Kinesiophobia; SD: Standard deviation.
Source: the authors (2023).

The mean overall pain assessed by the BPI was 5.1 ± 1.8 , pain at the time of collection was 2.9 ± 2.8 and pain in the last 24 hours was 4.5 ± 2.6 . 17 athletes reported treatment for pain, these being: Physiotherapy - 4 (14%), Pharmacological - 10 (34%), Cryotherapy - 3 (10%) and Resistance Training - 3 (10%). In the overall result of DN4, 9 (31%) participants presented neuropathic pain, 15 (51.7%) the score of 2 and 1, indicating neuropathic symptoms and 5 (17.2%) absence of neuropathic pain. In TSK, an overall average of 33.8 ± 6.7 was observed in the score, with 18 participants presenting "mild"; 11, "moderate" degree and no "severe".

Participants reported pain in multiple areas of the body, 4 (13.8%) reported pain in only one region. The regions: anterior face of the right knee, anterior face of the left knee and shoulder and left pectoral were more affected, being 12 (41%) for the first and 9 (31%) for the subsequent regions (Figure 1). In the case of pain interference in aspects of life, general activities were the most impacted item (5.2 ± 3.1), while the ability to walk (3.9 ± 2.3) and the relationship with other people (2.2 ± 0.9) presented less interference (Table 2).

Figure 1. Anatomical regions most affected by pain (bpi)



4 = Left shoulder and pectoral; 18 = Posterior Cervical; 24 = Dorsum-lumbar
 30 = Sacral and intergluteal; 36 = Right Knee – anterior; 37 = Left knee - anterior.
 Source: the authors (2023).

Table 2. Interference of pain in aspects of life

Frequency of answers (Mean ± SD)	
Aspects of life	Interference
General Activity	5,2±3,1
Mood	4,8±3,0
Sleep	4,7±3,0
Walking Ability	3,9±2,3
Work	4,3±2,7
Relations with other people	2,2±0,9
Enjoyment of life	4,2±2,8

Source: the authors (2023).

Regarding the characteristics of neuropathic pain, pinprick/needle was present in 15 (51.7%) of the interviewees, shock and tingling in 10 (34.4%) reports, followed by falling asleep with 8 athletes (27.5%) (Figure 2). In the evaluation of kinesiophobia, of all the items answered, five presented tendencies to the response "Totally Disagree", that is, a percentage of the participants marked this alternative. These were the items: "15"; "2"; "14"; "1" and "17". For the possibility of "Totally Agree" answers, item "10" stood out, in which 55% of the participants marked this alternative (Table 3).

Table 3. Tampa Scale for Kinesiophobia items (TSK)

Items	Totally Disagree	Parcially Disagree	Parcially Agree	Totally Agree
1	55%*	6%	31%	6%
2	65%*	13%	13%	6%
3	20%	6%	31%	41%
4	24%	41%	13%	20%
6	48%	10%	34%	6%
7	27%	13%	27%	31%
9	48%	6%	17%	27%
10	3%	10%	31%	55%*
11	20%	17%	41%	20%
12	48%	27%	3%	20%
13	13%	13%	27%	44%
14	58%*	24%	13%	3%
15	72%*	6%	10%	10%
16	27%	31%	27%	13%
17	51%*	31%	10%	6%

*Items that presented a number 50% of respondents marking it, for a certain possibility of response.
 Source: the authors (2023).

Discussion

Most athletes were between 30 and 40 years of age, with practice time between 20 and 30 years, and most of them graduated in black belt. The overall mean pain in BPI was 5.1 1.8 and in DN4, 31% of participants had neuropathic pain. Of the athletes who were in treatment, the majority (34%) opted for the pharmacological treatment and 62% of them had mild kinesiophobia. Few studies in the literature describe the pain profile and kinesiophobia in athletes; highlighting the importance of knowing this clinical profile to outline clinical management strategies and sports performance.

Unlike the results of Manzato⁸, who found a higher incidence of ankle sprain (25.2%) and shoulder dislocation (17.8%), we identified a higher incidence of pain in the anterior face of the right knee (41.0%), anterior face of the left knee (31.0%) and shoulder and left pectoral (31.0%). The results corroborate in part, with Cynarski¹⁶, who found knees (28%) and shoulders (22%) as the most prevalent regions. However, the most prevalent pains were in the fingers (30%).¹⁶

This pattern of injuries is also found in jiu-jitsu, which has biomechanics similar to that of Judo, and has a higher incidence of knee injuries (16.3%).¹⁷ Still on jiu-jitsu, another study¹⁸ showed an even higher incidence of knee injuries (71%), followed by the spine (29%) and shoulder (29%), similar to this study. The fourth most prevalent pain region was lumbosacral and intergluteal (27.6%). Okada et al. reported a correlation between nonspecific pain in this region and abnormal radiological findings in the lumbar region in elite Japanese judokas, with an incidence of low back pain of 35.4% and 81.7% of abnormal radiological findings.¹⁹

The type of treatment most chosen by the athletes in this study was pharmacological (34%), agreeing with another study that reports this as the most used way to manage medium to moderate pain, to return to sport on the same day; probably due to its ease of use and speed in the pain reduction response in most cases. Physiotherapy was the second most chosen option (14%), and also showed an important role in the treatment of subacute and chronic pain; followed by cryotherapy and resistance training (exercise therapy), the latter also widely used.²

Although the injury index in judo is significant, and it is directly related to the techniques applied^{6,7}, there was not enough frequency between practice and the presence of neuropathic pain. Raudenbush et al. found in his study a high resistance to pain developed by contact athletes.²⁰ However, it was not a similar modality to that studied in this work, which is a possible limitation in the literature regarding pain resistance in this specific population of martial arts.

In the TSK the participants presented "mild" (62%) and "moderate" degree (37%), with no participant presenting "severe" kinesiophobia, differing from the data of a study²¹ that applied the TSK in athletes, in which a frequency of 31%, 29%, and 39% for the "mild" degrees was found, "moderate" and "severe", respectively. However, the mean age (25.16 ± 5.32 years) and the mean time of practice (10.34 ± 5.99 years)²¹ were, respectively, 9 and 13 years less than that of this study. In addition, most of the athletes interviewed were not from martial arts, with these representing 7% of the total sample (n=105), with the largest number of participants being soccer players (33%) and football players (18%), possibly explaining the difference described above.

Exposure to pain was not a decisive factor in how judo athletes relate to other people or the ability to appreciate life, showing that although there is an exposure to a stressor, social relationships can be maintained satisfactorily, no repercussions on the athletes' routine. Participants reported varied rates of influence of pain on mood, probably related to the degree of pain, as well as in the study by Siebra et al., which showed that chronic pain can affect the mood and quality of life of patients.²²

Validated tools allow a more scientific and less inaccurate knowledge, allowing a better understanding of pain, its limitations and disabilities. Contact sport athletes develop different lesions, ranging from complications in the temporo-mandibular joint to overtraining.^{5,23} For this diversification, scales can be applied to quantify and/or qualify the painful condition and facilitate its interpretation as the Nordic Questionnaire of Musculoskeletal Symptoms (NMQ)²⁴ and the General Perceived Self-efficacy Scale (GSE)²⁵ also applied in athletes, both being validated for the Portuguese language and presenting good reliability to assess the painful condition.

Martial arts share prolonged exposure to pain, recurrent trauma and increased tolerance, according to exposure time⁴, and it is at this point that this work shows its relevance. However, it should be emphasized the need to carry out new studies with different sports modalities and a greater number of participants, enabling a better understanding of the athlete's relationship with pain, the impacts on their personal and professional routine, methods of prevention and recovery after injury.

Conclusion

The athletes presented moderate pain with little impact on personal life and the regions with the highest incidence were the knees, left shoulder and spine. Mild kinesiphobia was present in more than half of the participants and one third presented neuropathic pain with pin/needle and/or shock characteristics

Although they present pain in much of their day, these do not have a significant impact on other areas of the athlete's life (general activity, mood, work, ambulation, interpersonal relationships, sleep and ability to enjoy life).

Authors' contributions

Sestelo ES and Ribeiro GL participated in the conception of the research question, methodological design, search and data analysis, interpretation of the results and writing of the scientific article. Goes BT and Santos CPC participated in the conception of the research question, data collection, guidance and review of the research project and writing of the scientific article. All authors have reviewed and approved the final version and are in agreement with its publication.

Conflicts of interest

No financial, legal or political conflict involving third parties (government, companies and private foundations, etc.) has been declared for any aspect of the submitted work (including but not limited to grants and funding, participation in advisory board, study design, manuscript preparation, statistical analysis, etc.).

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