

Pain in Athletes: Current Knowledge and Challenges

Rafael Krasic Alaiti¹, Felipe J.J. Reis² ^a

¹ Nucleus of Neuroscience and Behavior and Nucleus of Applied Neuroscience, Universidade de São Paulo; Research, Technology, and Data Science Office, Grupo Superador, ² Department of Physiotherapy, Instituto Federal do Rio de Janeiro; Pain in Motion Research Group, Department of Physiotherapy, Human Physiology and Anatomy, Faculty of Physical Education & Physiotherapy, Vrije Universiteit Brussel

Keywords: pain management, athletic injury

<https://doi.org/10.26603/001c.37675>

International Journal of Sports Physical Therapy

Vol. 17, Issue 6, 2022

Pain in athletes has been traditionally equated with tissue damage (i.e., an acute traumatic or overuse injury).¹ However, chronic pain presents a challenge to team sports since it is not fully explained by ongoing biomechanical stress or overuse injury. Although biomechanical factors can indeed be a relevant nociceptive input for some individuals, it cannot be the main factor to explain pain in athletes.

Knowledge about pain has evolved during the last three decades from a cartesian (pain = tissue damage) into a multidimensional perspective in which several factors such as tissue overload, nociceptive gain, cognitive, emotional, behavioral, lifestyle and several other factors interact in complex ways, leaving the individual more or less prone to experience pain.² It is well-known that chronic pain cannot be explained solely by patho-anatomical changes. Thus, a narrow focus on biophysical factors (e.g., structural, biomechanical) can contribute to misconceptions about pain, higher threat value of pain, protective behavior and foster disability.¹ In addition, it can lead to overtesting (unnecessary exams), overdetection (detection of clinically unimportant findings), overtreatment (unnecessary treatment for a condition that is not life-threatening or would never cause any symptoms) and high costs.^{1,3}

Although the International Olympic Committee (IOC) published a consensus on pain management in elite athletes enhancing the biopsychosocial approach,⁴ the clinical implications of applying current pain knowledge to clinical practice has been barely discussed. According to the IOC consensus, a rational approach to pain management in athletes begins with classifying the type of pain.⁴ In this aspect, pain can be classified by its time frame (i.e., acute or chronic), mechanism of onset (i.e., traumatic or non-traumatic) and according to its manifestation (i.e., gradual or sudden). Pain can be classified by its mechanisms as nociceptive, neuropathic or nociplastic. In chronic pain cases,

pain can also be classified using the current version of the International Classification of Diseases (ICD-11) as chronic primary pain (e.g., chronic non-specific low back pain) or chronic secondary pain, (e.g., chronic cancer pain, chronic posttraumatic and postsurgical pain, chronic neuropathic pain, chronic headache and orofacial pain, chronic visceral pain, and chronic musculoskeletal pain).⁵

Adequate chronic pain management in athletes depends on identifying pain mechanisms and contributory factors considering a multidimensional perspective. For example, the most commonly reported risk factors for low back pain in sports were higher athlete training volumes, change to increased training load and history of low back pain.⁶ Nevertheless, psychosocial factors including emotional distress, symptoms of anxiety, catastrophic thinking, and pain-related fear, were associated with prolonged recovery and lower return to sport rates.⁷ Pain catastrophizing was reported as the most important factor associated with increased pain intensity in injured athletes.⁷ An athlete's psychological readiness to return to play was associated with the outcomes of rehabilitation.⁸ The literature presents evidence that pain-related fear, maladaptive beliefs, catastrophizing, and avoidance behavior are key factors in the development of disability in chronic musculoskeletal and primary pain conditions.⁹ The social domain is less commonly discussed in the literature and usually involves relationships, social support, engagement in care, environmental influences, and socioeconomic factors.¹⁰

Although there have been substantial advances in pain knowledge, there are still some challenges to overcome to properly apply these concepts in sports. First, pain experience should be considered based on complex systems approaches, meaning that pain experience results from the dynamic and non-linear interactions among many (known and unknown) factors. Team sports should also be aware to avoid the pendulum swinging too far from a biophysical to

^a **Corresponding author:**

Prof. Felipe Reis

Federal Institute of Rio de Janeiro, Campus Realengo - Rua Carlos Wenceslau, 343, Realengo. CEP 21715-000, Rio de Janeiro - RJ - Brazil.

Physiotherapy Department - Federal Institute of Education, Science and Technology Rio de Janeiro- IFRJ, Rio de Janeiro, Brazil

Phone +55 (21) 3463-4497

Email: felipe.reis@ifrj.edu.br

a narrow psychosocial perspective. Thus, it is important not to overlook the “bio” in the multidimensional perspective, since training parameters and biomechanical factors can be associated with some clinical conditions (e.g., lower limb tendinopathy). It is also important to recognize the limitations of the biopsychosocial model in which several factors (e.g., mental health, guilt, stigma, emotional support, feelings of shame, perceived injustice, interpersonal relationships, culture, class, macro socio-economic, political context, religiosity/spirituality, access to healthcare, sleep and nutrition quality) are rarely investigated and their influence on the athlete’s pain experience remains unknown.¹⁰ Second, the implementation of the current ICD classification for chronic pain in sports can contribute to better epidemiological data since definitions and reporting styles across studies present a broad variation. Third, focus on the biophysical factors (e.g., exams, tests) can lay aside patient’s perspective on wellness and care experiences. In this as-

pect, team sports should implement patient-reported outcome measures in their clinical pain assessment to establish patient-oriented evidence to better inform patient care decisions. Several measurement instruments have been developed and tested in non-athletes. Thus, efforts to develop athlete-specific or sport-specific assessment instruments should be done. Lastly, pain curriculum and training in undergraduate health care programs are insufficient in different disciplines and countries. Further discussion on the need and implementation of a specific course in pain and in sports in professional degree education programs should be considered.

Submitted: August 01, 2022 CDT, Accepted: August 14, 2022 CDT



This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CCBY-NC-4.0). View this license's legal deed at <https://creativecommons.org/licenses/by-nc/4.0> and legal code at <https://creativecommons.org/licenses/by-nc/4.0/legalcode> for more information.

REFERENCES

1. Caneiro JP, Alaiti RK, Fukusawa L, Hespanhol L, Brukner P, O'sullivan PP. There is more to pain than tissue damage: eight principles to guide care of acute non-traumatic pain in sport. *Br J Sports Med.* 2020;55(2):75-77. [doi:10.1136/bjsports-2019-101705](https://doi.org/10.1136/bjsports-2019-101705)
2. Lee H, Hübscher M, Moseley GL, et al. How does pain lead to disability? A systematic review and meta-analysis of mediation studies in people with back and neck pain. *Pain.* 2015;156(6):988-997. [doi:10.1097/j.pain.000000000000146](https://doi.org/10.1097/j.pain.000000000000146)
3. Maher CG, O'Keefe M, Buchbinder R, Harris IA. Musculoskeletal healthcare: Have we over-egged the pudding? *Int J Rheum Dis.* 2019;22(11):1957-1960. [doi:10.1111/1756-185x.13710](https://doi.org/10.1111/1756-185x.13710)
4. Hainline B, Derman W, Vernec A, et al. International Olympic Committee consensus statement on pain management in elite athletes. *Br J Sports Med.* 2017;51(17):1245-1258. [doi:10.1136/bjsports-2017-097884](https://doi.org/10.1136/bjsports-2017-097884)
5. Treede RD, Rief W, Barke A, et al. A classification of chronic pain for ICD-11. *Pain.* 2015;156(6):1003-1007. [doi:10.1097/j.pain.000000000000160](https://doi.org/10.1097/j.pain.000000000000160)
6. Wilson F, Ardern CL, Hartvigsen J, et al. Prevalence and risk factors for back pain in sports: a systematic review with meta-analysis. *Br J Sports Med.* 2021;55(11):601-607. [doi:10.1136/bjsports-2020-102537](https://doi.org/10.1136/bjsports-2020-102537)
7. Fischerauer SF, Talaei-Khoei M, Bexkens R, Ring DC, Oh LS, Vranceanu AM. What is the relationship of fear avoidance to physical function and pain intensity in injured athletes? *Clin Orthop Relat Res.* 2018;476(4):754-763. [doi:10.1007/s11999-0000000000000085](https://doi.org/10.1007/s11999-0000000000000085)
8. Forsdyke D, Smith A, Jones M, Gledhill A. Psychosocial factors associated with outcomes of sports injury rehabilitation in competitive athletes: a mixed studies systematic review. *Br J Sports Med.* 2016;50(9):537-544. [doi:10.1136/bjsports-2015-094850](https://doi.org/10.1136/bjsports-2015-094850)
9. Leeuw M, Goossens MEJB, Linton SJ, Crombez G, Boersma K, Vlaeyen JWS. The fear-avoidance model of musculoskeletal pain: Current state of scientific evidence. *J Behav Med.* 2007;30(1):77-94. [doi:10.1007/s10865-006-9085-0](https://doi.org/10.1007/s10865-006-9085-0)
10. Mescouto K, Olson RE, Hodges PW, Setchell J. A critical review of the biopsychosocial model of low back pain care: time for a new approach? *Disabil Rehabil.* 2020;7:1-15.