

# Links between Sports Injuries and Mental Health in Elite Athletes: the current state of affairs

Laura Gil Caselles<sup>1</sup>, Aurelio Olmedilla Zafra<sup>2</sup>

<sup>1</sup>Facultad de Ciencias del Deporte. Campus Mare Nostrum. Universidad de Murcia. <sup>2</sup>Departamento de Personalidad, Evaluación y Tratamiento Psicológicos. Universidad de Murcia.

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## Summary

Currently, the studies that have been carried out on sports injuries are mostly focused on physical factors as the main cause; however, empirical evidence shows the importance of psychological factors. Therefore, we must focus on identifying the most relevant variables surrounding sports injuries, that is, those that can influence their appearance and/or rehabilitation. Mental health disorders have become one of the most relevant problems today, and with it, the risk of suffering an injury is increasing. The objective of the present study is to carry out a systematic review of the scientific literature to know which mental health indicators are the most common in relation to sports injuries in elite athletes. A systematic review of the scientific literature will be carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. For this purpose, various databases have been used, such as: Scopus, Scielo, ResearchGate, MedlinePlus, Dialnet and Google Scholar. The selected documents were 6, all of them review articles published between 2016 and 2022. The results indicate that: there is a relationship between mental health and sports injuries; the prevalence of mental health symptoms in sport increases the risk of injury and delays rehabilitation; the number of injuries negatively affects the athlete's mental health; Injuries can increase the risk of mental health problems and adverse behaviors. In conclusion, this review shows how mental health indicators are significantly related to sports injuries, and how their relationship can lead to incorrect recovery for the athlete and/or being more exposed to suffering from it.

## Key words:

Mental Health. Athlete. Athletic injuries. Systematic review.

## Relación entre lesiones deportivas y salud mental en deportistas de élite: estado actual de la cuestión

### Resumen

Actualmente los estudios que se han llevado a cabo sobre las lesiones deportivas están centrados en su mayoría en los factores físicos como causa principal, sin embargo, la evidencia empírica muestra la importancia que ejercen los factores psicológicos. Por ello, debemos incidir en identificar aquellas variables más relevantes en torno a la lesión deportiva, es decir aquellas que puedan influir en su aparición y/o rehabilitación. Los trastornos de salud mental se han convertido en uno de los problemas más relevantes en la actualidad, y con ello, se está incrementando el riesgo de sufrir una lesión. El objetivo del presente estudio es realizar una revisión sistemática de la literatura científica para conocer que indicadores de salud mental son los que más inciden en torno a la lesión deportiva del deportista de élite. Se realizará una revisión sistemática de la literatura científica conforme a las directrices de Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Para ello, se han empleado diversas bases de datos, como son: Scopus, Scielo, ResearchGate, MedlinePlus, Dialnet y Google Scholar. Los documentos seleccionados han sido 5, todos ellos artículos de revisión publicados entre 2016 y 2022. Los resultados indican que: existe relación entre la salud mental y las lesiones deportivas; la prevalencia de síntomas de salud mental en el deporte aumenta el riesgo de padecer lesiones y retrasa su rehabilitación; el número de lesiones afecta negativamente a la salud mental del deportista; las lesiones pueden aumentar el riesgo de problemas de salud mental y comportamientos adversos. En conclusión, esta revisión de revisiones muestra como los indicadores de salud mental se relacionan de manera significativa con las lesiones deportivas, y cómo su relación puede acarrear en el deportista una incorrecta recuperación y/o que esté más expuesto a sufrirla.

## Palabras clave:

Salud Mental. Deportistas. Lesiones deportivas. Revisión sistemática.

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**Correspondence:** Laura Gil Caselles

E-mail: laura.gilc@um.es

## Introduction

The analysis of psychological factors that might impact athletic performance should be studied given the currently growing diversion in this sector and we need to consider that the number of athletes claiming to suffer mental health problems is growing every year<sup>1</sup>.

The practise of sport and physical exercise can be beneficial activities for the prevention and even treatment of symptoms stemming from mental disorders<sup>2,3</sup>. Nonetheless, elite athletes sometimes seem to be especially susceptible to presenting common mental disorders<sup>4,5</sup> and, in recent years, the number of athletes suffering from one emotional disorder or another seems to be rising considerably.

Consequently, scientific literature reflects the great importance that psychological factors have on both the risk of injury and recovery from injury<sup>6,7</sup>. Furthermore, it also reveals the importance of more integrated assessment of psychological function within the overall preparation of athletes in their training process<sup>8</sup>.

The mental conditions of an athlete should be dealt with throughout their sports career so as to achieve optimal performance and avoid injury<sup>9</sup>. Several mental health indicators can be detected during the sports career of an athlete, including generic stress factors and specific factors tied to the sport in question that can increase the risk of mental health symptoms and disorders.

Sports psychology researchers have unanimously agree that sport — at all levels — exposes the athlete to high levels of stress and anxiety<sup>10</sup>.

Numerous studies and research projects have shown that elite athletes — both those currently competing and those who have retired from competition — are linked to the deterioration of mental health, and depression in particular<sup>11</sup>.

Finally, tools should be used to recognise mental health in athletes and to facilitate the early detection of their symptoms so as to deal with them openly. Such reviews would be justified by the fact that there are no checks that consider mental health as a fundamental factor in the sports injuries suffered by elite athletes. However, there are many partial studies that would make this review necessary for revealing the current situation of the scientific problem and future research needs, as well as psychological intervention recommendations.

The overall objective of this study is to conduct a systematic review of scientific literature to reveal which mental health indicators are most closely tied to sports injury in elite athletes. More specifically: the studies that analyse the links between mental health indicators and their ties to propensity in athletes to injure themselves; and the studies that analyse the links between sports injury and its impact on mental health indicators in athletes.

## Material and method

### Search Design and Strategy

Review articles have been selected for this study; systematic review, meta-analysis and narrative reviews. Documents in both Spanish and English were used.

This article contains a systematic review of scientific literature in accordance with the guidelines of *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) for greater consistency and scientific rigour.

The following English keywords were used: *athletic injuries, systematic review, elite athletes, mental health*. In Spanish, the keywords were: *lesiones deportistas, revisión sistemática, deportistas élite, salud mental*. To combine them, *and/y* were chosen as Boolean operators. Finally, a total of 28 documents from various databases published between 2016 and 2023 were selected (Table 1).

### Inclusion and Exclusion Criteria

A series of inclusion and exclusion criteria were taken into consideration when conducting the systematic review. The criteria for inclusion were:

- Review articles published between 2016 and 2023.
- Review articles written in Spanish or English.
- The articles must contain a methodology section.
- The main topic of the documents must be sports injuries and mental health in elite athletes.

Books, reports, empirical articles, consensus articles and theses were excluded. Figure 1 shows a flowchart with the selection process to choose the documents for systematic review.

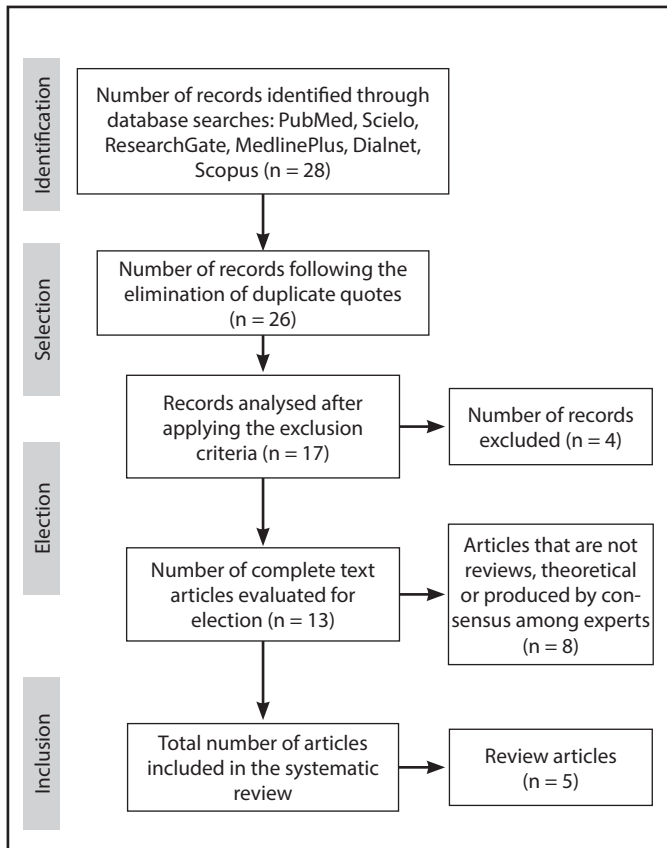
### Selection of Studies and Extraction of Data

Study eligibility was determined in two steps. Step 1 involved collecting a total of 28 potentially relevant quotes. Two of them were eliminated for duplicity, leaving a total of 26 quotes. Step 2 involved applying the exclusion criteria. Nine of the quotes were eliminated at this point. We then assessed and revised the complete text of the remaining studies. Verification of the articles led to the elimination of four more quotes due to a lack of access to the complete text, meaning

**Table 1. Databases consulted.**

Databases	Nº of Results Obtained	Nº of Related Works	Keywords Used
Google Scholar	38	7	Mental health and sports injuries
Dialnet	12	4	Mental health and sports injuries
MedlinePlus	8	3	Mental health, sports injuries, elite athletes
PubMed	15	4	Mental health and sport injuries
Scielo	21	2	Mental health and sport injuries
Scopus	26	8	Mental health and sport injuries

**Figure 1. Flowchart.**



that no additional relevance could be assigned to them. As a result, our systematic review includes five original studies that provide evidence on mental health in sport and its links to sports injuries.

We searched for information in each original reviewed article on: author, year of publication, sample size, age of the subjects, characteristics of the intervention (groups, type of activity, components, programme duration, number of sessions and their duration, measurement instruments and results obtained).

### Study Quality Assessment

The methodological quality of all the primary studies included was assessed. Based on a quality assessment tool used previously<sup>12</sup> and general recommendations on assessing the quality of primary studies, we developed a quality assessment tool designed specifically for this review. We included the following quality dimensions: (I) measurement of multidimensional perfectionism; (II) sample size; (III) research design; (IV) mental health indicators; (V) history of injuries; and (VI) sample design.

### Results

Table 2 contains the selection of articles for review. With that, we will be able to examine the available scientific evidence both quantitatively

and qualitatively. Furthermore, its analysis will help reveal what was observed and enable us to contribute our own results, which should verify the links between mental health and sports injuries in elite athletes.

### Discussion

This study sought to analyse the existing body of knowledge on the links between sports injuries and mental health in elite athletes. Specifically:

1. Determine which studies analyse the links between mental health and the propensity of an athlete to injure themselves.
2. Analyse the links between sports injury and its impact on the mental health of athletes.

The results enable reaffirmation of the claim that injuries constitute a fundamental problem in sport due to the epidemiology thereof, reflecting a high percentage of occurrence. This demonstrates that injuries therefore constitute an inherent phenomenon in the practise of sport, as mentioned by specialised scientific literature<sup>13</sup>, meaning that its study should be considered a fundamental issue in training and competency processes.

In terms of the first goal, the results of the review carried out indicate that a link is observed between mental health and sports injuries<sup>14,15</sup>. Rice<sup>3</sup> suggests the need to offer a mental health service to elite athletes. Of the five articles analysed, we found that mental health indicators (sleep, anxiety, stress, eating disorders, etc.) impact athletes by raising their vulnerability to injury and suffering from mental health problems<sup>16</sup> given that these articles provide useful information on preventing and intervening on their appearance or minimising the seriousness of the sports injury<sup>16,17</sup>. These factors grow if an athlete injures themselves, as it has been demonstrated that mental health plays a very important role in the response, rehabilitation and recovery from injury by the athlete<sup>18,19</sup>.

A number of authors, such as Åkesdotter<sup>20</sup> and Rice<sup>3</sup>, have highlighted risk factors related to the practise of sport at a high level, such as overtraining, exhaustion, injuries and excessive preoccupation with body weight, as well as genetic and environmental factors, and include such others as competitive failure, pain and concussion, among others. In fact, the study by Goutterborge<sup>2</sup> states that athletes can face up to 600 different stress factors, such as adverse life events, conflicts with the coach or professional dissatisfaction, that can lead to psychological pathologies. On the other hand, Broodryk<sup>21</sup> and other authors studied the effects of competition on stress, mood and anxiety in football players. They found that physiological and psychological variables combine to contribute to the stress response during competition, meaning it is important to concentrate on high-intensity activities and to minimise fatigue as both are linked to elevated levels of cortisol and negative moods.

In terms of the second goal, such authors as Olmedilla<sup>22</sup> claim that footballers manifest greater levels of depression, cognitive anxiety and somatic anxiety after suffering an injury and that this would reflect the

**Table 2. Reviews.**

Reardon, <i>et al.</i> 2019. Various countries					
Goal	Design	Data Collection System	Sample	Statistical Test	Main Findings
To foster a more standardised and evidence-based approach to mental health symptoms and disorders in elite athletes, a consensus work group of the International Olympic Committee critically evaluated the current scientific situation and offered recommendations.	Systematic review	The PubMed, SportDiscus, PSyclINFO, Scopus and Cochrane databases, as well as any other database considered relevant, were used.	Panel of experts consisting of 23 people from 13 countries with experience in the mental health of elite athletes.	None	The current scientific situation regarding the mental health of elite athletes suggests: that there is a lack of access to mental health services; more research and subsequent recommendations are needed to more widely identify the mental health of elite athletes. Within this context, the impact from sleep on recovery and on optimal preparedness should be considered; additional prevention strategies for mental health symptoms and disorders.
Rice, <i>et al.</i> 2019. Various countries					
Goal	Design	Data Collection System	Sample	Statistical Test	Main Findings
To identify and quantify the decisive factors in the anxiety symptoms and disorders experienced by elite athletes.	Systematic review and meta-analysis based on the PRISMA guidelines	Systematic search strategy. The search was conducted in the PubMed, SportDiscus, PSyclINFO, Scopus and Cochrane databases.	61 studies were included in the systematic review and 27 of them were suitable for meta-analysis.	Raw data were obtained (average, SD and n) for the decisive factors in anxiety. The general sizes of the effect were estimated by means of the standardised differentiation of averages.	The decisive factors in anxiety among elite populations broadly reflect those experienced by the general population. Doctors should be aware of these general and specific decisive factors in anxiety among elite athletes.
Rice, <i>et al.</i> 2018. Australia					
Goal	Design	Data Collection System	Sample	Statistical Test	Main Findings
To evaluate the base of evidence with regard to the link between sports-related concussion and mental health results in athletes competing at professional and elite levels.	Systematic review based on the PRISMA guidelines	A search was conducted in six databases: PubMed, EMBASE, SportDiscus, PSyclINFO, Cochrane and Cinahí.	27 studies	None	Current evidence suggests a link between sports-related concussion and the symptoms of depression in elite athletes. Causality cannot be determined at this stage of the research due to a lack of well designed prospective studies. More research is required that considers a range of mental health results in various samples of elite athletes/sports.
Souter, <i>et al.</i> 2018. UK					
Goal	Design	Data Collection System	Sample	Statistical Test	Main Findings
To explore the problems that affect men and mental health within the context of elite sport.	Literary review	Not reported	Review of the areas: injuries, stress, depression, anxiety, overtraining, eating disorders...	None	Major negative events in life, including injuries, can increase the risk of mental health problems in elite athletes. The risk of injury can increase when men suffer emotionally. As suggested by the literature, injuries can increase the risk of mental health problems and adverse behaviours.

(continues)

**Table 2. Reviews (continuation).**

Putukian M, et al. 2016. United States					
Goal	Design	Data Collection System	Sample	Statistical Test	Main Findings
To reveal the current state of knowledge on the psychological response to an injury in order to direct the injured athlete to a mental health care service provider when necessary.	Narrative review	Not reported	Elite athletes aged 16-23	None	The psychological response to injury can lead to more serious mental health problems, such as depression, anxiety, eating disorders and substance abuse. Obstacles exist to the treatment of mental health problems in athletes, and track and field coaches, team doctors and other medical service providers play an essential role in the recognition and identification of athletes at risk of mental health problems.

existence of an impact from the injury on mood and pre-competition anxiety.

All the processes through which an injured athlete pass represent an adaptive effort and that effort will mean they live through specific situations of overcoming adversity without the physical capacity to which they are accustomed, especially in elite athletes who are accustomed to sport being a part of life and part of their day-to-day activity. Various negative behaviours can arise following a sports injury, such as isolating oneself, not soliciting the services of the right professional, failure to adhere to recommendations and pain<sup>23</sup>, behaviours that can be controlled once an injury occurs. In that sense, just as stress makes a person more vulnerable to injury, the injury itself makes the subject more fragile vis-à-vis the possibility of suffering from stress<sup>24-26</sup>. Besides stress, other psychological and emotional processes are linked to sports injuries and directly impact the rehabilitation process in athletes<sup>27</sup>.

The study by Zurita, et al., reaffirms that injuries constitute a fundamental problem in sport due to the epidemiology thereof, reflecting a high percentage of occurrence. This demonstrates that injuries therefore constitute an inherent phenomenon in the practise of sport, as mentioned by specialised scientific literature<sup>28,29</sup>.

In essence, we were able to detect in numerous publications how the terms “mental health”, “anxiety”, “sleep quality”, “depression” and “stress” are mentioned by athletes, coaches and relatives within the field of sport with regard to discomfort in athletes at both psychological and physical levels.

## Conclusions

This systematic review reveals that sports injuries significantly affect mental health and how they can lead to incorrect recovery in athletes and/or make them more vulnerable to further injury. Mental health is essential for correct development in athletes and is vital to their performance. Furthermore, we were able to identify how the studies researched some of their indicators separately (stress and

injuries, anxiety and injuries, quality of sleep and injuries, depression and injuries) but not together. Mental health should be observed from a global perspective and its indicators should be analysed given that stress leads to anxiety, anxiety can lead to depression and all that combined can lead to poor rest and incorrect recovery due to a lack of sleep quality caused by the unease or restlessness that may manifest in athletes. Finally, mental health in athletes should be strengthened and action should be taken before problems arise through prevention programmes and the use of sports psychology as a fundamental tool for combating and/or treating it.

## Conflicts of Interest

The authors declare no conflict of interest whatsoever.

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