NICOLAUS COPERNICUS UNIVERSITY IN TORUŃ

Quality in Sport. eISSN 2450-3118.

Journal Home Page
https://apcz.umk.pl/QS/index

ZAŁUSKA Urszula, PERZYŃSKA Jagienka, BAGIŃSKA Weronika, PAWELEC Natalia, PODKOŚCIELNA Jaśmina, KRZYŻOWSKA Kinga, RYSZKOWSKA Kamila, SZYMCZYK Simone, PURSKA Aleksandra, JAKUBCZYK Jan. Depression in Athletes and Antidepressant Therapy: Implications for Performance, Recovery, and Training Adaptation. Quality in Sport. 2026;54:70729. eISSN 2450-3118. https://doi.org/10.12775/QS.2026.54.70729

The journal has been awarded 20 points in the parametric evaluation by the Ministry of Higher Education and Science of Poland. This is according to the Annex to the announcement of the Minister of Higher Education and Science dated 05.01.2024, No. 32553. The journal has a Unique Identifier: 201398. Scientific disciplines assigned: Economics and Finance (Field of Social Sciences); Management and Quality Sciences (Field of Social Sciences).
Punkty Ministerialne z 2019 - aktualny rok 20 punktów. Załącznik do komunikatu Ministra Szkolnictwa Wyższego i Nauki z dnia 05.01.2024 l.p. 32553. Posiada Unikatowy Identyfikator Czasopisma: 201398. Przypisane dyscypliny naukowe: Ekonomia i finanse (Dziedzina nauk społecznych); Nauki o zarządzaniu i jakości (Dziedzina nauk społecznych).
The authors declare that there is no conflict of interest regarding the publication of this paper.
Received: 10.04.2026. Revised: 17.04.2026. Accepted: 17.04.2026. Published: 23.04.2026.

Depression in Athletes and Antidepressant Therapy: Implications for Performance, Recovery, and Training Adaptation

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Depression in Athletes and Antidepressant Therapy: Implications for Performance, Recovery, and Training Adaptation

Background

Depression is a prevalent mental health disorder that significantly affects both the general population and athletes. Despite common perceptions of psychological resilience in sport, athletes are exposed to numerous risk factors such as performance pressure, injuries, and psychosocial stressors. Pharmacological treatment, particularly with antidepressants, plays a key role in managing moderate to severe depression; however, its potential effects on physical performance, recovery, and training adaptation remain a subject of concern in sport settings.

Aim

The aim of this study was to evaluate the role of antidepressant therapy in athletes, with particular emphasis on different pharmacological classes and their effects on sport performance, recovery processes, and training adaptation.

Materials and Methods

This study was conducted as a narrative review of scientific literature. Relevant publications were identified through databases including PubMed, Scopus, and Web of Science using predefined keywords related to depression, antidepressants, and sport performance. Studies

were selected based on eligibility criteria focusing on pharmacological treatment in athletes or physically active individuals. Data were extracted and analyzed qualitatively, with particular attention to mechanisms of action, physiological and psychological effects, and performance-related outcomes.

Results

The findings indicate that different classes of antidepressants exert distinct effects on athletes. Selective serotonin reuptake inhibitors (SSRIs) are the most commonly used and generally well tolerated but may contribute to fatigue and reduced motivation. Serotonin–norepinephrine reuptake inhibitors (SNRIs) may enhance energy levels and pain modulation, although they can affect cardiovascular responses. Tricyclic antidepressants (TCAs) and monoamine oxidase inhibitors (MAOIs) are less suitable due to unfavorable side-effect profiles. Atypical antidepressants demonstrate heterogeneous effects, ranging from activating to sedative, highlighting the importance of individualized treatment. Overall, antidepressant therapy may both positively and negatively influence performance and recovery, depending on the balance between therapeutic benefits and side effects.

Conclusions

Antidepressant therapy is an essential component of depression management in athletes but requires careful, individualized application. While certain medications may affect physiological and performance-related parameters, effective treatment of depressive symptoms can improve overall functioning and training consistency. An interdisciplinary approach integrating medical, psychological, and sport-specific expertise is crucial to optimize both mental health outcomes and athletic performance.

Keywords

depression; athletes; antidepressants; sport performance; recovery; training adaptation; mental health in sport; pharmacological treatment

1. Introduction

Depression is one of the most common mental health disorders worldwide and represents a significant clinical and public health concern [1,2]. It is characterized by persistent low mood, loss of interest or pleasure, cognitive impairment, and a range of somatic symptoms that may substantially impair daily functioning [1]. Although athletes are often perceived as physically and mentally resilient, growing evidence indicates that they are also vulnerable to depressive disorders, particularly due to performance pressure, injury, overtraining, and psychosocial stressors associated with competitive sport [2,3].

The prevalence of depression among athletes varies depending on sport type, competition level, and methodological differences across studies, but it is increasingly recognized as comparable to or even higher than in the general population [3,4]. Elite athletes may experience unique risk factors, including performance expectations, career instability, public scrutiny, and the

psychological impact of injuries [4]. Additionally, underreporting of mental health symptoms remains a significant issue due to stigma and concerns about negative consequences for athletic careers [5].

Effective management of depression in athletes requires a comprehensive and individualized approach that may include psychological interventions, lifestyle modification, and pharmacological treatment [1,6]. Among these, antidepressant therapy remains a cornerstone of clinical management, particularly in moderate to severe cases of depression [1]. However, the use of antidepressants in athletic populations raises specific concerns related to their potential effects on physical performance, recovery processes, thermoregulation, coordination, and overall physiological functioning [6,7].

Antidepressants encompass several pharmacological classes, including selective serotonin reuptake inhibitors (SSRIs), serotonin–norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), and atypical antidepressants [1,7]. These medications differ in their mechanisms of action, side-effect profiles, and potential interactions with physical activity and exercise performance. For example, some antidepressants may contribute to fatigue, altered cardiovascular responses, or changes in sleep patterns, while others may have activating effects that influence motivation and energy levels [6,7].

In the context of sport, these pharmacological effects are particularly relevant because even subtle changes in physiological or psychological functioning may impact training adaptation, competitive performance, and injury risk [3,6]. Moreover, certain antidepressants may raise concerns related to anti-doping regulations, further complicating treatment decisions in professional sport environments [5].

Recent publications in sport science, including those in *Quality in Sport*, emphasize the growing importance of integrating mental health management into athlete care and performance optimization strategies [8–10]. These works highlight the need for interdisciplinary approaches that combine medical, psychological, and sport-specific expertise to ensure both effective treatment and maintenance of athletic performance [6,9].

Despite the clinical importance of this topic, the available literature remains fragmented, with limited synthesis of how different classes of antidepressants affect athletes specifically [7,10]. Therefore, a comprehensive review is needed to evaluate current knowledge regarding pharmacological treatment of depression in sport populations, with particular emphasis on drug classification, mechanisms of action, and their implications for performance and recovery.

2. Research materials and methods

2.1 Data sources and eligibility criteria

This study was conducted as a narrative review of scientific literature examining the pharmacological treatment of depression in athletes, with particular emphasis on antidepressant therapy and its potential impact on physical performance and recovery [11–16]. The literature search was performed using major scientific databases commonly applied in medical and sport science research, including PubMed, Scopus, and Web of Science [11–13].

The search strategy was developed using combinations of keywords and Boolean operators. The primary search terms included *depression, antidepressants, athletes, sport performance, exercise, selective serotonin reuptake inhibitors (SSRIs), serotonin–norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), mental health in sport,* and *sport psychiatry* [11–16]. These terms were combined using logical operators such as **AND** and **OR** to identify relevant studies addressing pharmacological treatment of depression in physically active populations and athletes [11–13].

The inclusion criteria were defined to ensure that the analyzed literature was directly relevant to the objectives of the study [11–13]. Studies were included if they:

1. examined pharmacological treatment of depression using antidepressants,
2. included athlete populations or physically active individuals,
3. investigated the effects of antidepressants on physiological, psychological, or performance-related outcomes,
4. were published in peer-reviewed scientific journals,
5. were written in English [11–13].

Studies were excluded if they focused exclusively on non-pharmacological interventions, did not address depression or antidepressant therapy, or lacked sufficient methodological description [11–13]. Conference abstracts, case reports, and non-peer-reviewed publications were also excluded.

The growing interest in mental health in sport and the increasing recognition of depression among athletes highlight the importance of integrating psychiatric and sport science perspectives in research and clinical practice [14–20].

2.2 Study selection procedure

The study selection process followed a structured multi-stage screening procedure consistent with narrative review methodology [11–13]. Initially, all records identified through the database search were screened based on their titles and abstracts to determine their relevance to the topic of antidepressant treatment in athletes. Articles that appeared relevant during the preliminary screening stage were subsequently evaluated through full-text analysis [11,12].

During the full-text review stage, studies were assessed according to the predefined eligibility criteria. Particular attention was given to whether the studies examined specific classes of antidepressants and their physiological, psychological, or performance-related effects [14–17]. Studies investigating exercise responses, fatigue, recovery, thermoregulation, cardiovascular function, and cognitive performance in relation to antidepressant use were considered especially relevant [17,21–24].

In addition, review articles and clinical guidelines were included to provide a comprehensive overview of current pharmacological approaches to depression and their applicability in athletic populations [14–17].

2.3 Data collection and analysis

Relevant information from the selected studies was systematically extracted and organized for further analysis [11–13]. The data extraction process focused on key variables necessary for

understanding the role of antidepressant therapy in athletes. These variables included:
• type of antidepressant and pharmacological class
• mechanism of action of the drug
• effects on mood and psychiatric symptoms
• physiological effects relevant to sport performance (e.g., cardiovascular response, fatigue, thermoregulation)
• impact on recovery, sleep, and cognitive function
• potential side effects relevant to athletes
• implications for sport performance and training [14–17,21–24]

The extracted data were analyzed using a qualitative synthesis approach [11–13]. This method enabled the identification of recurring patterns, similarities, and differences between antidepressant classes in terms of their clinical and performance-related effects.

Particular attention was given to comparing different pharmacological groups of antidepressants and evaluating their potential advantages and limitations in sport settings [14–17,21–25]. The analysis also considered the balance between effective treatment of depressive symptoms and the preservation of optimal physical performance.

2.3.1 Statistical software

Because the present study represents a narrative review rather than an experimental investigation involving primary data collection, no statistical software was required for quantitative analysis. Data organization and management of bibliographic records were conducted using standard academic tools commonly applied in literature reviews [11–13].

2.3.2 AI

Artificial intelligence tools were used only as supportive instruments during the preparation of the manuscript. AI-assisted tools were used primarily to improve linguistic clarity and academic writing style. All methodological decisions, scientific interpretations, and conclusions presented in this article were made exclusively by the authors. AI tools were not used for data analysis or interpretation of research findings.

3. Research results and discussion

3.1 Selective serotonin reuptake inhibitors (SSRIs)

Selective serotonin reuptake inhibitors (SSRIs) represent the most commonly prescribed class of antidepressants in both the general population and athletic populations [15–17]. This group includes medications such as fluoxetine, sertraline, citalopram, escitalopram, and paroxetine. SSRIs exert their therapeutic effect primarily by inhibiting the reuptake of serotonin in the synaptic cleft, thereby increasing its availability and enhancing serotonergic neurotransmission [15,17].

From a clinical perspective, SSRIs are considered first-line pharmacological treatment for depression due to their favorable safety profile, relatively low risk of overdose, and broad therapeutic efficacy [15,16]. In athletes, SSRIs are often preferred because they are generally

well tolerated and have fewer severe side effects compared to older antidepressant classes [14–16].

However, SSRIs may still influence several physiological processes relevant to sport performance. Some studies suggest that SSRIs can be associated with increased fatigue, reduced motivation, and emotional blunting, which may negatively affect training intensity and competitive performance [17,21]. Additionally, serotonergic modulation has been linked to central fatigue mechanisms, potentially influencing endurance performance during prolonged exercise [17].

On the other hand, effective treatment of depressive symptoms may lead to improvements in motivation, concentration, and overall psychological well-being, which can positively influence training consistency and performance outcomes [14–16,18,19]. Therefore, the net effect of SSRIs in athletes depends on the balance between symptom improvement and potential side effects.

3.2 Serotonin–norepinephrine reuptake inhibitors (SNRIs)

Serotonin–norepinephrine reuptake inhibitors (SNRIs), including venlafaxine and duloxetine, act by inhibiting the reuptake of both serotonin and norepinephrine [15–17]. This dual mechanism of action may result in broader effects on mood regulation, energy levels, and pain perception.

In athletic populations, SNRIs may be particularly relevant due to their potential influence on both psychological and physiological parameters. Norepinephrine plays a key role in attention, arousal, and stress response, which are important factors in competitive sport environments [15,16]. Some evidence suggests that SNRIs may improve energy levels and reduce fatigue in certain individuals, potentially benefiting training engagement [15,16].

Moreover, SNRIs such as duloxetine are sometimes used in the management of chronic pain conditions, which may be relevant for athletes recovering from injuries [15,16,21]. However, potential side effects such as increased heart rate, elevated blood pressure, and sleep disturbances may negatively affect performance and recovery processes [21–24].

Therefore, while SNRIs may offer advantages in specific clinical situations, their use in athletes requires careful monitoring, particularly with regard to cardiovascular responses and training tolerance.

3.3 Tricyclic antidepressants (TCAs)

Tricyclic antidepressants (TCAs), including amitriptyline, imipramine, and nortriptyline, represent an older class of antidepressants that act by inhibiting the reuptake of serotonin and norepinephrine, while also affecting other neurotransmitter systems [15–17].

Although TCAs are effective in treating depression, their use in athletes is generally limited due to a higher risk of side effects compared to newer antidepressants [15,16]. Common adverse effects include sedation, weight gain, anticholinergic effects such as dry mouth and blurred vision, and cardiovascular complications, including arrhythmias [15–17].

From a sport performance perspective, sedation and reduced alertness may negatively affect reaction time, coordination, and overall physical performance [21,24]. Additionally, cardiovascular side effects may pose risks during high-intensity exercise.

Despite these limitations, TCAs may still be used in specific clinical cases, particularly when other treatments are ineffective. However, their use in athletes should be approached with caution and under close medical supervision.

3.4 Monoamine oxidase inhibitors (MAOIs)

Monoamine oxidase inhibitors (MAOIs), such as phenelzine and tranylcypromine, are among the oldest classes of antidepressants and function by inhibiting the activity of monoamine oxidase enzymes, thereby increasing the levels of serotonin, norepinephrine, and dopamine [15–17].

Due to their complex pharmacological profile and significant dietary restrictions, MAOIs are rarely used in athletic populations [15,16]. These medications require strict avoidance of tyramine-containing foods to prevent hypertensive crises, which may complicate dietary planning in athletes.

Additionally, MAOIs are associated with potential side effects such as dizziness, orthostatic hypotension, and sleep disturbances, all of which may negatively impact training and performance [21–24].

As a result, MAOIs are generally reserved for treatment-resistant depression and are not commonly considered a first-line option in athletes.

3.5 Atypical antidepressants

Atypical antidepressants represent a heterogeneous group of medications with diverse mechanisms of action [15–17]. This category includes drugs such as bupropion, mirtazapine, and trazodone.

Bupropion, which primarily affects dopamine and norepinephrine pathways, is of particular interest in sport settings due to its activating effects. It may enhance energy levels, motivation, and concentration, and has been suggested to have potential performance-enhancing properties under certain conditions [15,16,21]. However, concerns have been raised regarding its influence on thermoregulation and its potential classification within anti-doping regulations [21].

Mirtazapine, in contrast, is associated with sedative effects and is often used in patients with sleep disturbances. While improved sleep may support recovery processes, excessive sedation and weight gain may negatively affect athletic performance [22–24].

Trazodone is commonly used for its sedative properties, particularly in managing insomnia. Although it may improve sleep quality, its direct impact on performance remains limited [22,23].

The diverse effects of atypical antidepressants highlight the importance of individualized treatment strategies tailored to the specific needs of athletes [14–16].

3.6 Impact of antidepressant therapy on sport performance and recovery

The impact of antidepressant therapy on sport performance is complex and multifactorial. On one hand, effective treatment of depression can lead to improvements in mood, motivation, cognitive function, and overall psychological well-being, all of which are essential for consistent training and high-level performance [14–20].

On the other hand, antidepressants may produce side effects that influence physical performance, including fatigue, altered cardiovascular responses, impaired thermoregulation, and changes in neuromuscular coordination [17,21–24].

Recovery processes may also be affected, particularly through the influence of antidepressants on sleep quality, hormonal regulation, and stress response [22–24]. Adequate recovery is a critical component of training adaptation, and any pharmacological intervention that alters recovery dynamics may have significant implications for performance outcomes [21–25].

Recent research emphasizes the importance of an interdisciplinary approach to athlete care, integrating sport medicine, psychiatry, and coaching expertise [18–25]. Such an approach allows for the optimization of both mental health outcomes and physical performance, ensuring that pharmacological treatment is aligned with the specific demands of sport environments.

4. Discussion

The findings of this review highlight the complex relationship between pharmacological treatment of depression and sport performance in athletes. Antidepressant therapy represents a fundamental component of clinical management for depressive disorders; however, its application in athletic populations requires careful consideration due to the unique physiological and psychological demands of sport [14–17].

One of the most important observations is that different classes of antidepressants may exert distinct effects on both mental health outcomes and physical performance [15–17,21]. Selective serotonin reuptake inhibitors (SSRIs), which are the most commonly prescribed medications, are generally well tolerated and effective in reducing depressive symptoms. However, their potential association with fatigue, reduced motivation, and central fatigue mechanisms may influence endurance performance and training intensity [17,21]. This dual effect highlights the importance of balancing symptom improvement with potential performance-related consequences.

Serotonin–norepinephrine reuptake inhibitors (SNRIs) offer an alternative pharmacological option with potential benefits related to increased energy levels and improved pain modulation [15,16]. These effects may be advantageous in certain athletic contexts, particularly in individuals experiencing chronic pain or reduced motivation. At the same time, the potential cardiovascular effects of SNRIs, including increased heart rate and blood pressure, require careful monitoring in athletes engaged in high-intensity training [21–24].

Older classes of antidepressants, such as tricyclic antidepressants (TCAs) and monoamine oxidase inhibitors (MAOIs), appear to be less suitable for athletic populations due to their unfavorable side-effect profiles [15–17]. Sedation, impaired coordination, and cardiovascular

risks associated with these medications may negatively impact performance and increase the risk of adverse events during exercise [21,24]. Consequently, their use in athletes is generally limited to specific clinical situations in which other treatments have proven ineffective.

Atypical antidepressants present a more heterogeneous profile, with some agents potentially offering advantages in sport settings. For example, bupropion may enhance motivation and energy levels, which could positively influence training adherence and performance [15,16,21]. However, its potential effects on thermoregulation and its relevance within anti-doping frameworks must be carefully considered. In contrast, sedative agents such as mirtazapine and trazodone may support sleep and recovery, but their impact on daytime alertness and body composition may limit their suitability in certain sports [22–24].

Importantly, the findings of this review emphasize that the overall impact of antidepressant therapy on performance cannot be considered in isolation from its therapeutic benefits. Untreated depression is associated with decreased motivation, impaired concentration, reduced training adherence, and increased injury risk [14–20]. Therefore, effective treatment of depressive symptoms may, in many cases, result in an overall improvement in athletic performance despite potential pharmacological side effects.

The role of recovery should also be considered in this context. Antidepressants may influence sleep quality, stress regulation, and hormonal responses, all of which are critical components of recovery and adaptation to training [22–24]. The interaction between pharmacological treatment and recovery processes represents an important area for further research, particularly in high-performance sport environments.

Another important aspect highlighted by the reviewed literature is the need for an individualized and interdisciplinary approach to treatment [14,18,19,25]. The management of depression in athletes should involve collaboration between psychiatrists, sports physicians, psychologists, and coaches. Such an approach allows for the selection of appropriate pharmacological strategies while simultaneously considering sport-specific demands and performance goals.

Recent literature in sport science, including publications in *Quality in Sport*, emphasizes the increasing importance of integrating mental health care into athlete performance management systems [18–25]. These findings support the view that psychological well-being and physical performance are closely interconnected and should be addressed within a unified framework.

Despite the valuable insights provided by this review, several limitations should be acknowledged. The available literature on antidepressant use specifically in athlete populations remains limited, with many studies conducted in general or clinical populations [14–17]. Additionally, differences in study design, outcome measures, and athlete characteristics make direct comparisons between studies challenging. There is also a lack of long-term data regarding the effects of antidepressant therapy on performance and recovery in elite athletes.

Future research should focus on controlled studies examining the effects of different antidepressant classes on sport-specific performance variables, recovery processes, and injury risk [21–25]. Furthermore, greater attention should be given to the interaction between pharmacological treatment, training load, sleep, and psychological factors in athletic populations.

5. Conclusions

The present review examined the pharmacological treatment of depression in athletes, with particular emphasis on different classes of antidepressants and their potential impact on sport performance and recovery. The findings indicate that antidepressant therapy represents an essential component of clinical management for depressive disorders in athletic populations; however, its application requires careful consideration of both therapeutic benefits and possible performance-related effects [14–17].

Different classes of antidepressants demonstrate distinct pharmacological profiles that may influence physiological and psychological processes relevant to sport [15–17,21]. Selective serotonin reuptake inhibitors (SSRIs) remain the most commonly used and are generally well tolerated, although they may be associated with fatigue and reduced motivation in some individuals. Serotonin–norepinephrine reuptake inhibitors (SNRIs) may offer additional benefits related to energy and pain modulation, while older antidepressants such as tricyclic antidepressants (TCAs) and monoamine oxidase inhibitors (MAOIs) are less suitable for athletes due to their unfavorable side-effect profiles. Atypical antidepressants present diverse effects, highlighting the importance of individualized treatment strategies.

Importantly, the treatment of depression should not be viewed solely through the lens of potential performance impairment. Untreated depressive disorders may significantly reduce training adherence, cognitive functioning, and overall athletic performance [14–20]. Therefore, effective pharmacological treatment may, in many cases, contribute to improved performance outcomes by restoring psychological well-being and functional capacity.

The findings of this review underscore the necessity of an individualized and interdisciplinary approach to the management of depression in athletes [18–25]. Collaboration between medical professionals, including psychiatrists and sports physicians, as well as coaches and psychologists, is essential to optimize both mental health outcomes and sport performance.

Future research should focus on investigating the sport-specific effects of antidepressant therapy, including its impact on endurance, strength, recovery processes, and injury risk. There is also a need for longitudinal studies examining the long-term consequences of antidepressant use in athletic populations. Additionally, further research should explore the integration of pharmacological treatment with training strategies, recovery monitoring, and psychological interventions [21–25].

In conclusion, antidepressant therapy plays a crucial role in the management of depression in athletes and can support both mental health and athletic functioning when applied appropriately. Careful selection of pharmacological treatment, ongoing monitoring, and integration with sport-specific demands are essential to ensure optimal outcomes in this unique population.

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