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Effects of Cognitive Behavioural Therapy on Athletes: A Systematic Review

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Effects of Cognitive Behavioural Therapy in Athletes: A Systematic Review

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Declaration of Scientific Integrity

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Resumo:

Introdução: Os atletas enfrentam desafios significativos em termos de saúde mental, mas frequentemente hesitam em procurar apoio formal. A terapia cognitivo-comportamental (TCC) é eficaz em determinadas populações, porém o seu efeito específico nos atletas carece de mais investigação. Esta revisão sistemática tem como objetivo resumir e avaliar criticamente a evidência sobre os múltiplos efeitos das intervenções de TCC tradicional (segunda geração), quer na dimensão psicológica dos atletas (incluindo ansiedade, stress, motivação e resiliência), quer no seu desempenho desportivo (incluindo o resultado competitivo e a recuperação de lesões).

Métodos: Foi realizada uma revisão sistemática da literatura com os seguintes critérios de inclusão: ensaios clínicos aleatorizados (ECA), estudos quasi-experimentais e estudos aleatorizados por cluster de intervenções de TCC de segunda geração em atletas federados, universitários ou profissionais, independentemente do desporto, género ou idade; estudos publicados a partir de 2005 em inglês, espanhol ou português; estudos que reportassem resultados psicológicos e/ou relacionados com o desempenho. Excluíram-se estudos focados unicamente em abordagens de TCC de terceira geração. A pesquisa decorreu entre março e abril de 2025, utilizando as bases de dados PubMed e Cochrane Central Register of Controlled Trials (CENTRAL), tendo sido complementada pela consulta de motores de busca para a identificação de artigos adicionais. Não se procedeu a uma avaliação formal do risco de viés dos estudos individuais; todavia, as suas características metodológicas foram tidas em conta na interpretação dos resultados. Dada a heterogeneidade das intervenções, populações e desfechos, não foi realizada uma meta-análise.

Resultados: Foram incluídos oito estudos (3 ECAs, 1 ECA por cluster e 4 estudos quasi-experimentais) envolvendo 610 atletas (homens e mulheres, com idades entre a adolescência e a idade adulta jovem) de sete países. As intervenções compreenderam TCC tradicional, Terapia Comportamental Racional Emotiva (REBT), TCC baseada na Internet (iCBT), Treino de Competências Psicológicas (PST), Terapia de Inoculação de Stress (SIT) e aconselhamento cognitivo orientado para a carreira. As intervenções de TCC demonstraram consistentemente impactos psicológicos positivos, incluindo melhorias significativas na regulação da ansiedade e do stress, modificação de crenças irracionais e melhoria de competências mentais como autoconfiança e regulação emocional; por exemplo, a REBT reduziu efetivamente as crenças irracionais e a ansiedade competitiva. Os resultados relacionados com o desempenho foram mais variados: a SIT foi associada a uma menor incidência de lesões, e algumas abordagens da TCC melhoraram o desempenho subjetivo, as funções executivas ou os marcadores fisiológicos (por exemplo, composição corporal). No entanto, não foi consistentemente demonstrada uma ligação direta e uniforme a melhores resultados competitivos objetivos.

Discussão: As intervenções tradicionais da TCC mostram ampla utilidade na melhoria do bem-estar psicológico e das competências mentais específicas dos atletas. Embora o impacto no desempenho competitivo direto e objetivo seja menos claro, a TCC promove um ambiente interno mais favorável para os atletas. Contudo, a base de evidências é limitada pela qualidade metodológica variada, pela ausência de avaliações formais de risco de viés por estudo, pela heterogeneidade significativa e, muitas vezes, por medidas de desempenho subjetivas, sendo necessária mais investigação rigorosa com metodologias padronizadas.

Abstract

Background: Athletes face significant mental health challenges, yet frequently hesitate to look for formal support. Cognitive Behavioural Therapy (CBT) is effective in certain populations, but its specific effect on athletes requires further research. This systematic review aims to summarise and critically evaluate the evidence on the multiple effects of traditional (second wave) CBT interventions on athletes' psychological outcomes (including anxiety, stress, motivation, and resilience) and performance-related outcomes (such as athletic performance and injury recovery).

Methods: A systematic review of the literature was conducted using the following inclusion criteria: randomised clinical trials (RCTs), quasi-experimental studies, and cluster-randomised studies of second-wave CBT interventions for federated, collegiate, or professional athletes, regardless of sport, gender, or age; studies published from 2005 onwards in English, Spanish, or Portuguese; studies reporting on psychological and/or performance-related outcomes. Studies focusing solely on third-wave CBT approaches were excluded. The search was conducted between March and April 2025, using the PubMed and Cochrane Central Register of Controlled Trials (CENTRAL) databases, and was complemented by search engines to identify additional articles. A formal risk of bias assessment for individual studies was not performed; however, methodological characteristics were considered in the interpretation. Due to heterogeneity in interventions, populations, and outcomes, a meta-analysis was not conducted.

Results: Eight studies (3 RCTs, 1 cluster RCT, and 4 quasi-experimental studies) involving 610 athletes (male and female, aged early adolescence to young adulthood) from seven countries were included. Interventions comprised traditional CBT, Rational Emotive Behaviour Therapy (REBT), internet-based CBT (iCBT), Psychological Skills Training (PST), Stress Inoculation Therapy (SIT), and cognitive career-oriented counselling. CBT interventions consistently demonstrated positive psychological impacts, including significant improvements in anxiety and stress regulation, modification of irrational beliefs, and enhancement of mental skills like self-confidence and emotional regulation; for example, REBT effectively reduced irrational beliefs and competitive anxiety. Performance-related outcomes were more varied: SIT was associated with a reduced incidence of injury, and some CBT approaches improved subjective performance, executive functions, or physiological markers (e.g., body composition). However, a direct, uniform link to enhanced objective competitive results was less consistently demonstrated.

Discussion: Traditional CBT interventions show broad utility in enhancing athletes' psychological well-being and specific mental skills. While the impact on direct, objective competitive performance is less clear-cut, CBT fosters a more favourable internal environment for athletes. However, the evidence base is limited by varied methodological quality, the absence of formal risk of bias assessments per study, significant heterogeneity, and often subjective performance measures. Further rigorous research with standardised methodologies is needed.

Abbreviation's List

CBT - Cognitive Behavioural Therapy

COPE - Creating Opportunities for Personal Empowerment

iCBT - Internet-based Cognitive Behavioural Therapy

K6 - Kessler-6 scale

PICOS - Population, Intervention, Comparison, Outcome, Study design

PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PST - Psychological Skills Training

RCT - Randomised Controlled Trial

REBT - Rational Emotive Behaviour Therapy

SIT - Stress Inoculation Therapy

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Background

The main goal for athletes is to be the most competitive they can, and to do that, they need not only physical health but also mental well-being. In an environment where pressure can be significant and results dictate success, an athlete must have mental strength.[1] Moreover, the necessity to be better increases with the professional level, while the margins become thinner. If two runners share the same personal record, their mental state may become the deciding factor on the big stage.[2]

Athletes are vulnerable to different mental health symptoms and disorders, with prevalence rates at least comparable to those observable in the general population.[3] The prevalence of mental health symptoms and disorders among male elite athletes in team sports has been reported to range from 5% for burnout and adverse alcohol use to nearly 45% for anxiety and depression.[4] Other studies have shown that between 5% and 35% of elite athletes are affected by mental health disorders within 12 months. In the case of eating disorders, they are particularly common among female elite athletes, while collegiate athletes report similar challenges, with 10% to 25% reporting symptoms of problems such as depression and eating disorders.[4] Formal help-seeking behaviour amongst athletes, however, appears to be lower than in non-athlete populations, potentially due to poorer attitudes towards seeking help and lower service utilisation. A systematic review and meta-analysis of help-seeking behaviour in athletes reported a pooled proportion of 22.4% seeking formal help.[3] Furthermore, mental health challenges can persist into retirement from sport.[5]

The development of mental health issues in athletes is multifactorial, involving a complex interaction of sport-specific stressors, individual characteristics, and environmental influences. Sporting-related stressors include the pressure to perform, risk of injury and associated recovery processes, deselection, intense competition, demanding training loads, overtraining, and potential lack of financial security.[4] These stressors are particularly salient for elite youth athletes navigating developmental transitions alongside athletic demands. Individual factors such as maladaptive perfectionism, high athletic identity, and coping skills also play a significant role.[4 6] Team culture, social support (or lack thereof), and the overall talent development environment are critical determinants as a negative team culture and perceived stigma within the sport setting can act as significant barriers to help-seeking.[3]

Management strategies for mental health symptoms and disorders in elite athletes should adopt a comprehensive, integrative, and personalised approach, addressing the biopsychosocial factors relevant to this population. Both non-pharmacological and pharmacological interventions may be indicated.[4] Conservative approaches can include various forms of psychotherapy, including psychological skills training (PST), cognitive behavioural therapy (CBT), and positive psychology interventions. The effectiveness of these methods in enhancing overall well-being among elite athletes has been suggested, although further robust research is needed.[7] Pharmacological treatment may be considered, with specific notice to potential impacts on athletic performance, therapeutic and non-therapeutic performance-enhancing effects, and safety risks.[8] Additionally, the use of certain substances may pose anti-doping compliance risks, potentially leading to sanctions or even disqualification under regulations established by entities such as the World Anti-Doping Agency.[9] A collaborative effort involving sports medicine physicians, mental health professionals, coaches, and other support staff is vital for successful treatment and ongoing care.[4]

CBT is a form of psychotherapy widely recognised as effective in treating various mental health conditions, such as depressive and anxiety disorders, substance use problems, eating disorders and mental disorders. Substantial research supports the efficacy of CBT in terms of functional outcomes and general quality of life, being as effective as pharmacological treatment, in some cases even more so.[10]

The first wave of CBT interventions was known as behaviour therapy and emerged in the 1950s and 1960s as an alternative to psychoanalysis. Its fundamental principles were rooted in learning theories, notably classical and operant conditioning, while the primary emphasis was on the relation between the observable behaviour and environmental contingencies.[11] Pathology was viewed as a set of learned behaviours maintained by reinforcements and punishments in the environment. Standard techniques included systematic desensitisation, contingency management, and exposure.[12]

The second wave, which emerged in the 1970s and onwards, is traditional CBT. This wave arose from the growing need to value cognitive processes, such as thoughts, beliefs, and attitudes, in shaping emotional and behavioural responses, which had been neglected until then.[11] The central premise was that the interpretation of a situation influences emotions and behaviours. The focus shifted to identifying and modifying maladaptive thoughts and beliefs to provoke emotional and behavioural changes.[13] Different techniques, like identifying automatic thoughts, cognitive restructuring, and behavioural experiments, were implemented to change the thinking content. Beck's Cognitive Therapy and Ellis's Rational Emotive Behaviour Therapy (REBT) are prominent examples of this wave. Compared to the first wave, the second wave added a cognitive dimension to the behavioural base, acknowledging the importance of internal mental processes.[12]

The third wave of CBT began to gain prominence around 2004. Its fundamental premises include accepting thoughts and feelings (rather than struggling against them), focusing on the context and function of psychological phenomena, and committing to personal values to guide action.[14] It's supported by the idea that developing psychological flexibility enables individuals to act according to their values despite complex thoughts and feelings. Typical techniques include mindfulness, acceptance, cognitive defusion, values clarification, and committed action, with examples found in therapies such as Mindfulness-Acceptance-Commitment Therapy (MAC), Dialectical Behaviour Therapy, Mindfulness-Based Cognitive Therapy, and Functional Analytic Psychotherapy.[15] The third wave builds upon the previous but adopts a different stance towards language and cognition, favouring function over content.[16]

A CBT intervention used today typically consists of a structured programme that can be delivered in person (e.g., through weekly sessions) or via the internet (e.g., via a smartphone app).[17] Its foundation consists of four strategies implemented flexibly depending on the patient's needs, goals, and preferences.

The first, called "cognitive restructuring", usually unfolds in three phases. Initially, the caregiver works with the patient, using methods like "Socratic questioning" and the "downward arrow" to identify distorted or unhelpful thoughts related to emotional distress. Then, using collaborative empiricism, therapists and patients critically examine the evidence for and against these thoughts. Ultimately, patients learn to develop adaptive responses through more realistic and

balanced thoughts, which in turn reduce distress. These responses should be meaningful and believable, and not simplistic affirmations. Tools like thought records, coping cards, and behavioural experiments are employed to reinforce learning.[18]

Behavioural action is the second strategy used in a cognitive behavioural intervention, aiming to re-engage the individual in pleasurable and fulfilling activities. The patient tracks and rates his hourly activities based on how rewarding or meaningful they feel, and subsequently plans specific rewarding activities to incorporate into his routine. This data often reveals a correlation between disengagement and mood decline, and, over time, scheduling meaningful activities builds momentum and improves mood.[18 19]

The third strategy used in CBT is exposure therapy. To reduce anxiety by confronting feared stimuli or situations, the patient should list those feared scenarios and rate their distress on a scale, which will help guide the approach sequence. Different types of exposure can be applied, namely “in vivo” with real-world exposure (e.g., touching a doorknob for contamination fears), “imaginal exposure” with visualisation of feared outcomes when actual exposure isn’t possible, and “interoceptive exposure” where bodily sensations are triggered (e.g., racing heart) to reduce the fear of anxiety itself. The patient's fear can decrease through repeated exposure, following the habituation model, or the therapist can focus on disconfirming the patient’s negative expectations, enabling him to tolerate the fear in the long term.[18 20]

At last, CBT employs the fourth strategy, problem-solving therapy, to equip patients with structured skills for managing everyday hardships, especially when they feel overwhelmed. With the therapist's help, the individual goes through problem definition and goal setting, generation of alternatives, decision-making, for example, through pros and cons analysis, culminating with solution implementation and evaluation. Other tools, like externalisation (writing problems down) and stress-reduction techniques (e.g., breathing exercises), may also be used to support problem-solving.[18 21]

CBT has been extensively studied in clinical and general populations; however, athletes experience different psychological conditions, such as performance anxiety, injury recovery, and identity challenges, which may affect not only the application of a CBT intervention but also its effectiveness. Although there is evidence suggesting that CBT has potential beneficial effects on mental wellbeing among elite athletes, confidence in these findings is currently limited by a lack of research.

Objectives

This systematic review aims to summarise and critically evaluate the evidence on the multiple effects of CBT when implemented on athletes. Therefore, it intends to analyse how CBT influences outcomes including anxiety, stress, and motivation, as well as its possible impact on athletic performance and recovery processes. By identifying consistent findings and research gaps, this review seeks to give a current context of the psychological support of athletes.

Methods

This systematic review was conducted in accordance with the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines and the PICOS framework (Population, Intervention, Comparison, Outcome, Study design).[22] No review protocol was registered prior to the initiation of the review.

Following the definition of athletes proposed by Araújo et al. (2016)[23], the population of interest comprised athletes from federated, collegiate, or professional settings, regardless of sport type, gender, or age. Interventions had to be based on second-wave or traditional CBT, including techniques such as cognitive restructuring and behavioural activation. Programs that focused solely on third-wave approaches, such as mindfulness-based therapies, acceptance and commitment interventions, or yoga without a cognitive-behavioural framework, were excluded. Eligible outcomes included psychological variables (such as anxiety, stress control, motivational level, and self-confidence) and/or performance-related outcomes (such as performance impact or injury incidence).

This review included randomised controlled trials (RCTs), quasi-experimental studies, and cluster-randomised studies. Case studies, purely qualitative research, review articles, and opinion papers were excluded. Finally, only studies published in English, Spanish, or Portuguese from the year 2005 onward were included.

A computer-based search was conducted between March and April 2025 using the PubMed and Cochrane Central Register of Controlled Trials (CENTRAL) databases. In addition to database searches, four relevant articles were identified through search engines.

The following search terms were used to identify relevant studies in both databases, with appropriate adaptations to syntax as needed: ((athlet* [tiab]) OR (Sportsmen [tiab]) OR (sportswomen [tiab]) OR (Runner* [tiab]) OR (cyclist* [tiab]) OR ("Football player*" [tiab]) OR (rower* [tiab]) OR (gymnast* [tiab]) OR ("basketball player*" [tiab]) OR ("tennis player*" [tiab]) OR (swimmer* [tiab]) OR ("wrestler*" [tiab]) OR (weightlifter* [tiab]) OR ("soccer player*" [tiab]) OR ("volleyball player*" [tiab]) OR ("cricket player*" [tiab]) OR ("hockey player*" [tiab]) OR ("baseball player*" [tiab]) OR (athlete[Mesh:NoExp])) AND (("cognitive behavioral therapy"[mh]) OR (CBT [tiab]) OR ("cognitive therapy" [tiab]) OR ("behavior therapy" [tiab])) AND (((randomized controlled trial[pt]) OR (controlled clinical trial[pt]) OR (randomized[tiab]) OR (placebo[tiab]) OR (drug therapy[sh]) OR (randomly[tiab]) OR (trial[tiab]) OR (groups[tiab])) NOT (animals [mh] NOT humans [mh])).

All retrieved records were exported to EndNote, and duplicate entries were eliminated. One reviewer screened the titles and abstracts for relevance. Full texts of potentially eligible studies were subsequently obtained and evaluated in accordance with the inclusion and exclusion criteria. To clarify uncertainties and finalise eligibility decisions, a second reviewer was consulted. Any discrepancies were settled through discussion between reviewers. The study selection process followed PRISMA guidelines.

The following information was gathered from each study: authors and year of publication, country of origin, study design, sample size, and participant characteristics (including age, gender, and type of sport), a description of the intervention, outcome measures, and key findings.

A formal assessment of the risk of bias or methodological quality among the included studies was not performed. This choice stemmed from the variety of study designs and outcome measures. Nonetheless, the interpretation of the findings has taken into account study designs and fundamental methodological aspects, such as the existence of control groups, sample size, and intervention duration.

Given the diversity of the included studies in terms of intervention characteristics, outcome measures, and study designs, a meta-analysis was not conducted. Instead, a narrative synthesis was undertaken to summarise and interpret the findings. This method enabled the recognition of patterns and recurring themes in the literature, while also emphasising inconsistencies and gaps in the existing evidence on the effects of CBT in athletic populations.

Results

Results of the search

A total of 147 records were identified through database searches, and 4 additional records were found through other sources. After removing duplicates, 113 titles and abstracts were screened for eligibility. Of these, 26 full-text articles were thoroughly assessed. Following the application of inclusion and exclusion criteria, eight studies were included in the final review. The study selection process is summarised in the PRISMA 2020 flow diagram (Figure 1).

Included studies

The eight included studies were published between 2006 and 2024 and were conducted in seven different countries: the United States[24], Spain[25 26], Switzerland[27], Japan[28], Taiwan[29], Hungary[30], and South Africa[31]. The study designs included RCTs (n = 3), quasi-experimental studies (n = 4), and one cluster randomised trial.

Sample sizes ranged from 37 to 153 participants, totalling 610 athletes across the studies. Participants included both male and female athletes, with ages ranging from early adolescence to young adulthood. The sports represented in the studies encompassed football[25 26], rugby[31], ice hockey[30], and multi-sport populations[24 27-29].

All studies examined the effects of CBT or CBT-based interventions tailored for athletes. These included traditional CBT programmes, REBT, internet-based CBT (iCBT), PST, Stress Inoculation Therapy (SIT), and cognitive career-oriented counselling. The duration, format, and content of the interventions varied significantly among studies.

The outcomes assessed were varied and included both psychological factors and performance-related measures. Common psychological outcomes comprised anxiety (both general and competitive), perceived stress, motivation, self-confidence, burnout, perfectionism, irrational beliefs, and emotional regulation. Performance-related outcomes included athlete satisfaction, subjective performance evaluations, and the incidence of injuries.

A detailed summary of the characteristics of the included studies is presented in Table 1.

Excluded studies

During the full-text assessment phase, we excluded a total of 18 studies. Sixteen of these were excluded because their interventions were solely based on third-wave CBT approaches, such as mindfulness-based interventions, meditation, yoga, or acceptance-focused strategies, without incorporating essential cognitive-behavioural techniques. Although these methods are part of the broader CBT framework, they fell outside the scope of this review, which explicitly aimed at traditional or structured CBT interventions typical of second-wave CBT. Additionally, two studies were excluded due to the lack of a comparison or control group, thereby limiting their ability to demonstrate the intervention's impact with adequate methodological rigour.

Risk of bias in included studies

As outlined in the Methods, a formal risk of bias or methodological quality assessment was not conducted due to the exploratory nature of the review and the heterogeneity of study designs and outcomes. However, the interpretation of findings has taken into account key methodological characteristics, including study design, presence of control groups, sample size, and intervention duration.

Effects of interventions

The eight included studies collectively evaluated a diverse range of cognitive-behavioural therapy and CBT-derived interventions aimed at improving psychological states and performance-related factors in various athlete populations. Across these studies, despite variations in specific intervention types, duration, delivery modes, and participant demographics, a general pattern of positive psychological impact emerged. Benefits were frequently noted in areas such as anxiety and stress regulation, modification of irrational beliefs, and enhancement of core psychological skills. A few studies also explored outcomes pertinent to athletic performance, including injury rates, executive functions, and subjective or objective performance measures, revealing a spectrum of findings. The main findings of the included studies are presented in Table 2.

Psychological Outcomes

A consistent finding across the majority of the studies was the significant improvement in various psychological outcomes post-intervention. For example, Munnik et al. (2024)[31] conducted a cluster randomised trial with adolescent male rugby players, finding that a 7-week REBT programme resulted in statistically significant reductions in irrational beliefs ($p < 0.001$) and competitive anxiety ($p = 0.011$), as well as improvements in subjective performance, when compared with a MAC group and a wait-list control. Similarly, Tóth et al. (2023)[30], in a study with Hungarian junior ice hockey players, demonstrated that an 8-week group REBT intervention was effective in reducing competitive anxiety ($p = 0.02$), perfectionism ($p = 0.03$), and irrational beliefs ($p = 0.03$).

Interventions focusing on broader psychological skills also yielded positive results. Domínguez González et al. (2024)[25] employed a 13-week psychological intervention programme incorporating cognitive-behavioural and mindfulness therapies for young male football players, noting significant improvements in stress control ($p < .001$), motivation ($p < .01$), cognitive anxiety ($p < .01$), and self-confidence ($p < .05$), in the experimental group. In a randomised controlled trial by Röthlin et al. (2020)[27] with competitive athletes from various sports, a 4-week PST programme, rooted in CBT principles, improved athletes' capacity to manage emotional interference with performance (probabilities > 99%), enhanced attention control (probabilities > 91%), and reduced performance-related worries and negative cognitions when compared to a wait-list control group (probabilities > 89%).

The mode of delivery also showed flexibility. Sekizaki et al. (2017)[28] investigated a 4-week iCBT programme for Japanese high school male athletes and observed that while K6 scores (measuring depression and anxiety) in the intervention group remained stable, they significantly worsened in the control group ($p = .013$), suggesting a protective or buffering effect of iCBT on mood and anxiety. Even very brief interventions showed some psychological benefits; Peng & Johanson (2006)[29] reported that just two sessions of cognitive career-oriented group counselling for Taiwanese college student athletes led to significantly lower ($p = .001$) mean state anxiety in the treated group compared to the control group, although no change in career maturity was detected. Buffington et al. (2016)[24], using the COPE (Creating Opportunities for Personal Empowerment) CBT-based intervention with female Division I U.S. Air Force Academy athletes, found that while there were no significant decreases in self-reported anxiety in the intervention groups, their perceived stress levels did not increase, in contrast to the control group which experienced a significant rise in stress ($p < .05$).

Performance-Related Outcomes

Some studies also investigated outcomes more directly linked to athletic performance, physiological changes, or injury prevention, presenting a more varied landscape of results than those related to psychological outcomes. A notable finding was the significant reduction in sports injury incidence reported by Olmedilla-Zafra et al. (2017)[26]. Their 3-month stress-management programme, based on SIT, led to a statistically significant decrease ($p < 0.005$) in the average number of injuries sustained by young male football players in the intervention group compared to a non-treatment group.

Improvements in factors that can underpin performance were also identified. Munnik et al. (2024)[31] noted a significant improvement ($p = 0.045$) in subjective performance ratings among rugby players who underwent REBT. Tóth et al. (2023)[30] found that their REBT intervention enhanced specific executive functions in junior ice hockey players, speed of information processing ($p < 0.01$) and cognitive flexibility ($p = .001$), which are cognitive processes relevant to on-field performance. Buffington et al. (2016)[24] observed positive physiological and behavioural changes in their study of female military athletes; the COPE CBT intervention groups demonstrated significant reductions in percentage body fat ($p < .05$) and made more favourable dietary choices, including reduced consumption of total and saturated fats ($p < .05$).

However, the translation of psychological improvements into direct, objective measures of competitive success was not always evident. For example, Sekizaki et al. (2017)[28] focused on psychological well-being as a prerequisite for performance but did not directly assess athletic performance outcomes. Similarly, Röthlin et al. (2020)[27] focused on psychological factors relevant to performance rather than objective performance itself.

Discussion

The findings of this systematic review, drawing from eight studies, highlight the broad utility of second-wave or traditional CBT-based approaches in enhancing athletes' psychological well-being, improving specific mental skills (such as emotional and attentional regulation), reducing negative cognitive patterns, and bolstering coping mechanisms across different sporting contexts and age groups. This consistent pattern of positive psychological impact resonates strongly with the extensive evidence supporting CBT's efficacy for a variety of mental health conditions within general populations. Given that athletes face mental health challenges at rates comparable to the general populace but often demonstrate lower help-seeking behaviours, the clear psychological benefits observed in this review are particularly pertinent. The results suggest that CBT interventions, when appropriately adapted, can effectively address the unique psychological demands and sport-specific stressors inherent in athletic careers, such as performance anxiety and injury recovery. This review's compilation of benefits across various CBT modalities contributes to expanding the evidence base and enhancing confidence in CBT's role in supporting athlete mental health, an area previously identified as needing more robust research.

Regarding performance-related outcomes, the assessment of these in the included CBT intervention studies reveals a more complex picture. Whilst interventions were found to consistently foster psychological states and skills conducive to better performance (e.g., reduced anxiety, better stress management, enhanced focus), and in some cases led to tangible benefits such as reduced injury rates or improvements in physical or cognitive markers (e.g., executive functions, body composition changes), the direct impact on objective competitive results was less objectively demonstrated. This observation aligns with the understanding that athletic success is profoundly multifactorial. The pressures to perform and the fine margins for success at higher levels of competition mean that while psychological readiness is vital, its direct translation into consistently superior competitive rankings is influenced by numerous other variables. Furthermore, the variability in how performance-related outcomes were measured across the reviewed studies, ranging from subjective self-reports and injury statistics to specific cognitive tests, physiological data, and championship placings, highlights the fundamental difficulty in making definitive conclusions about direct performance enhancement from CBT alone. The findings suggest, however, that by improving underlying psychological, physiological, and cognitive factors, CBT creates a more favourable internal environment for athletes to achieve their potential.

Limitations

Whilst this review identified a general pattern of positive psychological impact from traditional cognitive-behavioural therapy interventions for athletes, several limitations within the included

body of evidence must be considered. The methodological quality varied, with the eight studies comprising three RCTs, one cluster randomised trial, and four quasi-experimental studies. The predominance of quasi-experimental designs, characterised by the lack of randomisation and selection bias, may limit internal validity. This suggests that the possibility of unmeasured confounding factors influencing the observed effects cannot be overlooked, particularly since a formal bias risk assessment was not conducted for each study due to the exploratory nature of the review and its heterogeneity.

Significant discrepancies in CBT intervention specifics (e.g., REBT, SIT, PST), their duration (ranging from two sessions to 13-week programmes), athlete populations, and outcome measures also presented challenges. This diversity, while demonstrating CBT's broad applicability, made it difficult to pinpoint the most effective intervention components and precluded a quantitative meta-analysis. Sample sizes also varied (37 to 153 participants), with smaller studies potentially limiting statistical power and generalisability. Some studies included homogeneous groups, such as only male young athletes, which restricts the conclusions that can be drawn across genders.

Several studies relied on self-report measures, which are susceptible to social desirability bias and may not accurately capture clinical change. Only a few studies (e.g., Oldemilla-Zafra et al.[26]) included coach perspectives, limiting ecological validity.

Furthermore, the assessment of performance-related outcomes was particularly diverse, often relying on subjective or indirect markers. Although some studies reported benefits, such as reduced injury rates or improved executive functions, a consistent link to enhanced objective competitive results was less evident. This variability in performance measurement complicates drawing firm conclusions about CBT's direct efficacy for on-field success. These limitations collectively suggest that while CBT shows considerable promise, the current evidence base requires further research with more standardised methodologies to strengthen the certainty of specific effects.

Most studies involved non-clinical or subclinical samples, such as healthy athletes experiencing mild anxiety or performance stress. It's unclear whether similar interventions would be effective in clinical populations diagnosed with anxiety or depressive disorders.

It is also important to acknowledge certain limitations inherent in the processes used to conduct this systematic review, which may influence the interpretation of its findings. Firstly, as explicitly stated in the methods, a formal assessment of the risk of bias for each of the eight included studies was not performed. This decision, stemming from the exploratory nature of the review and study heterogeneity, means that the potential impact of specific biases within the studies on the overall synthesis could not be systematically quantified, making it more challenging to ascertain the certainty of the evidence.

Secondly, due to significant diversity in intervention characteristics, athlete populations, and outcome measures among the included studies, a quantitative meta-analysis was not undertaken. Instead, a narrative synthesis was employed, which, while useful for identifying patterns, does not provide a pooled statistical estimate of treatment effects, possibly limiting the precision of the overall conclusions.

Thirdly, the search strategy was conducted up to April 2025 and restricted to studies in English, Spanish, or Portuguese from 2005 onwards. These restrictions might have led to the omission of some relevant research. Furthermore, the initial screening of titles and abstracts by a single reviewer, with a second reviewer consulted for final eligibility decisions based on full texts, could potentially introduce a degree of selection bias. These limitations should be taken into account when evaluating the scope and strength of the review's conclusions.

Implications for Practice and Future Research

The demonstrated positive psychological impact of second-wave CBT interventions supports their wider integration into athlete support programmes. Practitioners should consider tailored applications of modalities like REBT for irrational beliefs and anxiety, SIT for stress and injury reduction, and PST for broader mental skill enhancement. iCBT also presents a valuable, accessible delivery option. While direct links to objective competitive results are multifaceted, fostering psychological resilience and well-being through CBT is a valuable foundation for athletes to achieve their full potential, considering their individual needs, the specific sport, and their developmental stage.

CBT, beyond its established role in treating psychological disorders, may also contribute to the enhancement of athletic performance by targeting cognitive and emotional factors that influence competitive functioning. This dual potential makes CBT particularly valuable in the sports context, as it can serve as an entry point for mental health intervention that is perceived as performance-oriented rather than pathology-based. Consequently, this may reduce stigma and increase the likelihood that athletes seek psychological support, thereby promoting both performance optimisation and mental well-being.

Sports organisations and governing bodies should consider implementing policies that enhance athletes' access to evidence-based psychological support, including CBT. This entails promoting mental health education, investing in qualified practitioners, and cultivating a culture that destigmatises the act of seeking help. Programmes like SIT could also be beneficially integrated into routine athlete care due to the link between stress management and injury prevention. CBT may be particularly well-suited to elite athletes due to its structured, goal-oriented, and time-limited approach, which aligns with the performance-driven and disciplined culture of high-level sports.

To refine the application of CBT in athletic contexts, future research should prioritise several key areas. There is a clear need for more methodologically robust RCTs, with adequate sample sizes and appropriate control groups. Greater standardisation in reporting CBT intervention components, particularly in outcome measures—including the development of core outcome sets for both psychological constructs and objective athletic performance—is crucial for improving study comparability and enabling meta-analyses.

Further research should explore the relative effectiveness of various traditional CBT modalities and their core components, as well as the long-term sustainability of intervention effects. The specific relationship between CBT-induced psychological changes and objective athletic performance requires more direct investigation using validated, sport-specific measures. Studies

should also include underrepresented athlete populations, examining potential moderators of treatment effects (e.g., age, gender, sport type). Finally, ongoing exploration of the effectiveness and cost-effectiveness of diverse delivery models, such as iCBT, is crucial for advancing the field. Addressing these research gaps will be essential for a more definitive understanding of how traditional CBT can best support athletes.

Conclusion

This systematic review aimed to evaluate the evidence regarding the effects of traditional, second-wave CBT for athletes. The findings from the eight included studies consistently demonstrate positive psychological impacts, with athletes showing improvements in anxiety and stress regulation, modification of irrational beliefs, and enhanced core mental skills such as self-confidence and emotional control. These benefits suggest that CBT is a valuable tool for fostering psychological well-being in athletic populations. The impact of CBT on direct performance-related outcomes was more varied; while tangible benefits such as reduced injury incidence, improved subjective performance, and enhanced executive functions were observed in some instances, a clear link to superior objective competitive results was not uniformly established, reflecting the multifactorial nature of athletic success.

It is important to consider these conclusions in light of limitations within both the reviewed evidence (including methodological diversity and a lack of formal risk of bias assessments) and the review process itself. Nevertheless, this review provides encouraging, albeit not definitive, support for the utility of second-wave CBT in aiding athletes. There remains a clear and pressing need for further methodologically rigorous research, employing standardised outcome measures, particularly for objective athletic performance, to more robustly determine the specific effects and full potential of CBT interventions in sport.

Figures

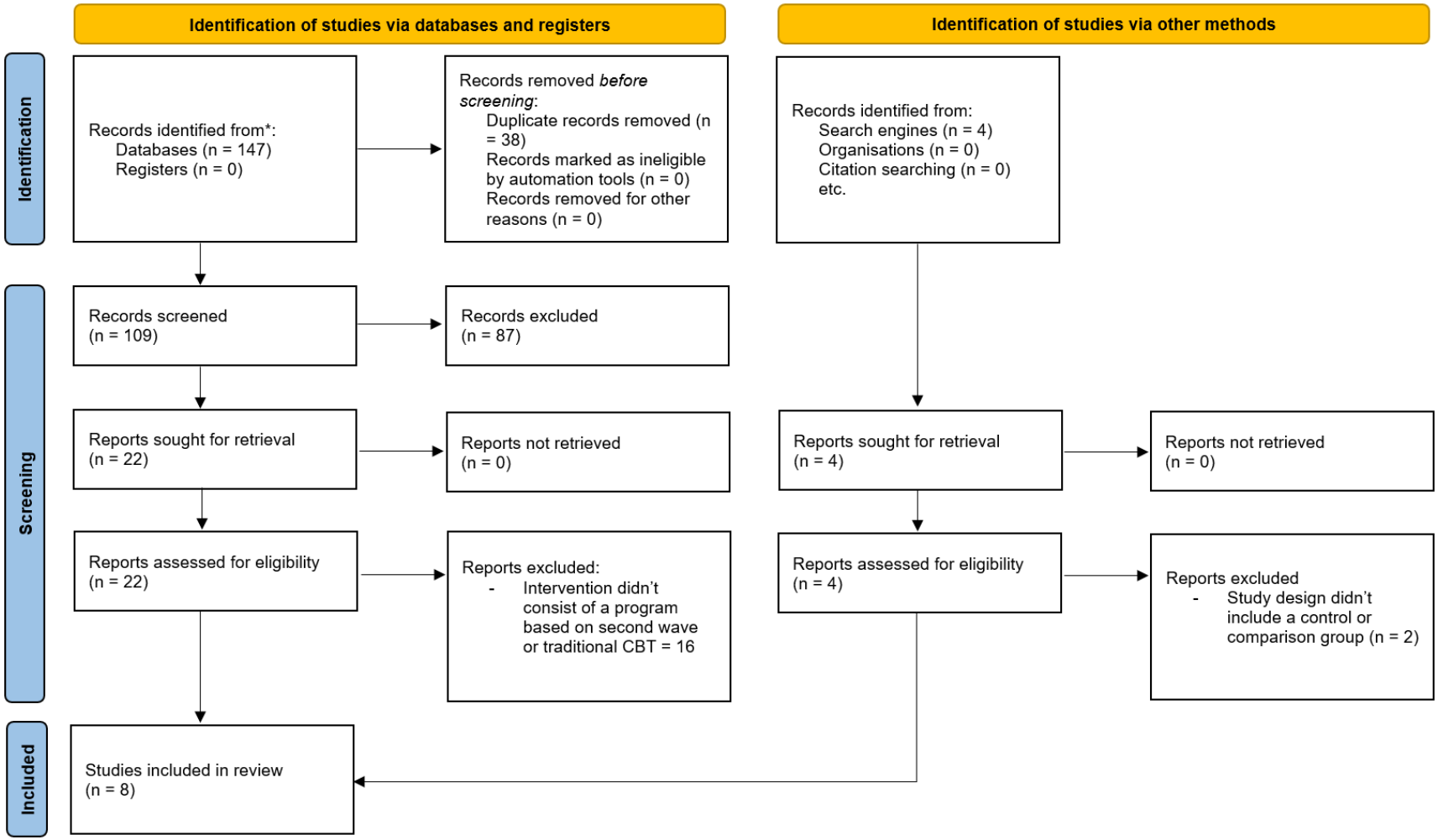


Figure 1. PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) flow chart of the eligibility process.

Tables

Table 1. Characteristics of the included Studies. CBT (Cognitive Behavioural Therapy); COPE (Creating Opportunities for Personal Empowerment); CRT (Cluster Randomised Controlled Trials); iCBT (Internet-based Cognitive Behavioural Therapy); MAC (Mindfulness-Acceptance-Commitment); MBI (Mindfulness-Based Intervention); PSI (Psychological Skills Training); RCT (Randomised Controlled Trial); REBT (Rational Emotive Behaviour Therapy); SIT (Stress Inoculation Therapy).

Authors & Year	Country	Study Design	Sample	Participant Characteristics & Sport	Intervention	Outcome and Measures
Buffington et al.[24] 2016	United States	RCT	*n*=153	Female USAFA Division I athletes, Multiple sports, aged 18-27	COPE programme	Body composition (DXA scan); Energy balance knowledge (Written Test); Perceived stress (Brief Inventory of Perceived Stress, BIPS); Anxiety (Generalised Anxiety Disorder 7-item scale, GAD-7); Nutritional intake (24-hour food recall)
González et al.[25] 2024	Spain	Quasi-experimental	*n*=37	Male Youth Soccer Players, aged 14-15	CBT programme	Anxiety, self-confidence (Competition State Anxiety Inventory-2, CSAI-2); Stress control, motivation, etc. (Psychological Characteristics Related to Sport Performance Questionnaire, CPRD); Attention, stress control, motivation, etc. (Psychological Inventory of Sport Performance, IPED)
Munnik et al.[31] 2024	South Africa	CRT	*n*=71	Male adolescent school-level rugby players, aged 15-19 years	REBT and MAC Programmes	Irrational beliefs (Shortened General Attitudes and Beliefs Scale, SGABS); Anxiety (Sport Competition Anxiety Test, SCAT); Subjective Performance (Single-item evaluation)
Oldemilla-Zafra et al.[26] 2017	Spain	Quasi-experimental	*n*=63	Male youth soccer players, aged 17-19, National Youth League	SIT programme	Injury incidence (Monthly injury rates); Athlete satisfaction (Survey); Coach perspectives (Interviews)

Peng & Johanson et al.[29] 2006	Taiwan	Quasi-experimental	*n*=65	Taiwanese college student-athletes, multiple sports, aged ~19.3 years	Cognitive career-oriented group counselling	Anxiety (State-Trait Anxiety Inventory – State form); Career Maturity (Career Maturity Inventory – Attitude scale)
Röthlin et al.[27] 2020	Switzerland	RCT	*n*=95	Elite and sub-elite athletes, aged ~24.43 years, multiple sports	PST and MBI programmes	Mindfulness (Five Facet Mindfulness Questionnaire – Short Form, FFMQ-SF); Use of mental strategies (Test of Performance Strategies, TOPS); Handling of emotions (TOPS; Acceptance and Action Questionnaire II, AAQ-II; Self-Assessment of Emotional Competencies, SEC-27); Attention in training and competition (TOPS); Perceived stress; Athletic performance (self-rated); General psychological symptoms (Brief Symptom Inventory, BSI)
Sekizaki et al.[28] 2016	Japan	RCT	*n*=80	Japanese high school boys, aged ~16.5±0.5 years, multiple sports	iCBT programme	Psychological distress including depression and anxiety (Kessler-6 scale, K6); General health (General Health Questionnaire, 12-item version, GHQ-12); Self-efficacy (General Self-Efficacy Scale, GSES); Athlete burnout; Competitive anxiety; Sleep problems; Fatigue; Motivation
Tóth et al.[30] 2023	Hungary	Quasi-experimental	*n*=46	Hungarian junior ice hockey players, aged ~14.8±1.5 years, male and female	Group-based REBT and MBI programmes	Competitive anxiety (Competition State Anxiety Inventory-2, CSAI-2); Perfectionism (Short Almost Perfect Scale, SAPS); Irrational beliefs (Irrational Performance Beliefs Inventory, iPBI); Salivary cortisol levels; Executive functions: working memory, inhibition, cognitive flexibility (Vienna Test System, VTS); Sport-specific self-esteem

Table 2. Summary of Findings on the Effects of Cognitive Behavioural Therapy in Athletes. CBT (Cognitive Behavioural Therapy); COPE (Creating Opportunities for Personal Empowerment); iCBT (Internet-based Cognitive Behavioural Therapy); MBI (Mindfulness-Based Intervention); PSI (Psychological Skills Training); REBT (Rational Emotive Behaviour Therapy); SIT (Stress Inoculation Therapy).

Key Outcome Domain	No. of Studies Reporting (Total Participants)	Summary of CBT Effects Observed in Included Studies	Key Contributing Studies (Authors, Year)
Psychological Outcomes			
Anxiety Regulation (Competitive, State, General)	6 (approx. 430)	CBT interventions (esp. REBT, iCBT, cognitive career counselling, PST) generally led to reductions or better management of various anxiety symptoms compared to control or baseline.	Munnik et al.[31]; Tóth et al.[30]; González et al.[25]; Peng & Johanson et al.[29]; Röthlin et al.[27]; Sekizaki et al.[28]
Stress Management / Control	3 (approx. 253)	CBT-based programmes (SIT, COPE) were associated with maintained or improved stress management/control or prevented increases in stress compared to control groups.	Olmedilla-Zafra et al.[26]; Buffington et al.[24]; González et al.[25]
Irrational Beliefs	2 (approx. 117)	REBT interventions effectively reduced irrational beliefs in athletes.	Munnik et al.[31]; Tóth et al.[30]
Perfectionism	1 (46 participants)	REBT intervention was effective in reducing perfectionism.	Tóth et al.[30]
Self-Confidence / Self-Esteem	2 (approx. 83)	CBT interventions demonstrated positive effects on self-confidence or self-esteem.	González et al.[25]; Tóth et al.[30]
Emotional Regulation / Handling of Emotions	1 (95 participants)	PST and MBI programmes improved the ability to prevent emotions from interfering with performance.	Röthlin et al.[27]

Motivation	2 (approx. 117)	Findings were mixed or context-dependent; one CBT programme showed positive effects on motivation dimensions, while another general intervention did not specifically report changes.	González et al.[25]; Sekizaki et al.[28]
Attentional Control	2 (approx. 132)	CBT interventions (PST, general CBT) were associated with improved attentional control.	González et al.[25]; Röthlin et al.[27]
Executive Functions	1 (46 participants)	REBT intervention improved some components of executive functions (speed of information processing, cognitive flexibility).	Tóth et al.[30]
Energy Balance Knowledge	1 (153 participants)	Educational CBT (COPE) programme significantly improved knowledge.	Buffington et al.[24]
Performance-Related Outcomes			
Injury Incidence	1 (63 participants)	SIT programme significantly decreased the average number of injuries compared to a non-treatment group.	Olmedilla-Zafra et al.[26]
Subjective Performance	1 (71 participants)	REBT intervention reported greater improvements in subjective performance ratings.	Munnik et al.[31]
Physiological Markers (Body Composition, Diet)	1 (153 participants)	COPE CBT programme led to significant reductions in body fat percentage and favourable dietary changes.	Buffington et al.[24]

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