



Managing pre-competition psychological pressure in elite athletes: a systematic review of stressors, anxiety interpretation, and coping strategies

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ABSTRACT

Elite athletes routinely face intense psychological pressure before competition, yet evidence on how they experience and regulate it remains dispersed across qualitative, correlational, and intervention research. This systematic review aimed to synthesise the sources and forms of pre-competition pressure reported by elite athletes, the coping strategies and mental skills they use, and the links between these strategies and performance readiness. The review followed the PRISMA 2020 framework and used a SPIDER-informed Boolean search of Scopus combining terms for elite athletes, psychological pressure, coping, and competition. The search identified 217 records. After removing 12 duplicates, 205 records were screened and 92 full-text reports were assessed against predefined criteria covering English-language primary empirical journal articles on elite or high-performance athletes published between 2005 and 2025. Fifteen studies were included and appraised with design-specific tools. Pressure arose from performance, organisational, and team-climate demands and was shaped more by appraisal and symptom interpretation than by anxiety intensity. Elite athletes combined imagery, self-talk, goal setting, routines, social support, and problem-focused coping, while mindfulness and hypnosis interventions reduced competitive anxiety and physiological stress. These findings support appraisal-based, individualised mental preparation. Future research should adopt longitudinal, ecologically valid, and culturally diverse designs.



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Introduction

Competitive sport at the elite level has become a highly visible arena in which outcomes carry considerable personal, financial, and national consequences, and the psychological demands attached to these outcomes are now recognised as a core element of athlete welfare (Souter et al., 2018; Walton et al., 2023). Athletes preparing for major championships must manage expectations from coaches, the media, and themselves while balancing heavy training loads (Devonport, 2015; Schinke et al., 2012). Anxiety is almost universal in elite sport, and recent mental health research indicates that its expression is not always confined to the competitive event itself (Walton et al., 2023). Understanding pressure regulation therefore matters for both performance and wellbeing, because demands that sharpen focus in some performers may erode confidence in others (Gucciardi, 2017; Souter et al., 2018).

The period immediately before competition represents a particularly sensitive window. Early exploratory work with gymnasts at Olympic trials suggested that patterns of cognition, including self-verbalisation and imagery, distinguished more successful from less successful performers (Mahoney & Avenier, 1977). Later research with Winter Olympians showed that the most stressful experiences were concentrated in the time before competition and were frequently linked to external distractions and expectations (Pensgaard & Ursin, 1998). Pre-competitive psychological states may also shape the coping options athletes deploy once the event begins, since defences measured before competition predicted task-oriented and disengagement-oriented coping during performance (Nicolas et al., 2017). This phase bridges long-term preparation and acute performance, and how pressure is appraised here can shape athletes' readiness to compete (Devonport, 2015; Schinke et al., 2012).

A substantial body of research has catalogued the demands that elite performers encounter. Qualitative work has described organisational stressors such as selection, finances, leadership, and team atmosphere among athletes preparing for international events (Woodman & Hardy, 2001), as well as sources of stress extending beyond the competitive event among professional footballers (Noblet & Gifford, 2002). Coaches of elite athletes report comparable stressors, suggesting that pressure circulates throughout the performance environment (Thelwell et al., 2008). Coping research has distinguished approach, avoidance, task-focused, and emotion-focused responses to acute competitive stressors (Anshel et al., 2000), and has linked achievement goal orientations to the coping strategies used by Olympians (Pensgaard & Roberts, 2003). Cross-cultural evidence further shows that how often a strategy is used does not necessarily reflect how effective athletes perceive it to be (Hoedaya & Anshel, 2003).

More recent studies have broadened the conceptual and methodological scope of this field. Mindfulness-based approaches have attracted growing interest, and a recent scoping review reported reductions in stress, anxiety, and cortisol alongside gains in confidence among high-performance athletes (Pereira et al., 2024). Psychophysiological tools now track autonomic and endocrine responses, showing, for example, that coherent breathing stabilised cortisol and raised parasympathetic activity during simulated competition (Chiron et al., 2025). Research has also moved beyond the individual, with mixed-method findings indicating that high-level teams may appraise and address stressful match situations collectively through communal coping (Mahot et al., 2026). Imagery research has also identified self-efficacy as a mediator between imagery ability and stress in competitive martial artists (Di Corrado et al., 2025). These developments signal a shift from describing stressors towards explaining regulation (Pereira et al., 2024; Schinke et al., 2012).

Despite this growth, the evidence remains fragmented. Research on stressors, anxiety interpretation, coping, and interventions has largely developed in separate streams, which makes it difficult to see how the pressures elite athletes report relate to the strategies they choose and the readiness states they reach (Devonport, 2015; Schinke et al., 2012). Accounts from athletes competing at the very highest level also remain relatively scarce, a limitation noted in recent research on Olympic preparation (Aase et al., 2025). Cultural context adds further complexity, because culturally normative attitudes can be experienced as either facilitative or debilitative to performance (Casuga et al., 2017), and the perceived effectiveness of coping may differ between national groups (Hoedaya & Anshel, 2003). A synthesis centred on athletes' experiences that also integrates quantitative and intervention evidence is therefore needed (Aase et al., 2025; Walton et al., 2023).

A second gap concerns theoretical and methodological coherence. Much of the literature relies on retrospective self-report collected after major events, as in research with Winter Olympians (Pensgaard & Roberts, 2003; Pensgaard & Ursin, 1998), which can blur the temporal distinction between pre-competition and in-competition experience (Nicolas et al., 2017). Although appraisal-based and transactional models are frequently invoked, few syntheses have tested whether the evidence supports a sequence running from stressor to appraisal, coping, and readiness (Schinke et al., 2012). Many elite athletes also have limited exposure to sport psychology support, which complicates translation into practice (Waite et al., 2022). Without an integrated review, practitioners have little guidance on which strategies are backed by convergent evidence and which remain promising but insufficiently tested (Pereira et al., 2024; Walton et al., 2023).

This systematic review responds to these gaps by synthesising primary empirical studies of elite and high-performance athletes that examined psychological pressure and its management in the pre-competition and competition period. By combining qualitative, correlational, and intervention designs in one appraisal-informed synthesis, it offers an integrated account of how elite athletes move from experiencing pressure to readiness, informing appraisal-focused mental preparation (Devonport, 2015; Souter et al., 2018). Three research questions guided the review:

RQ1: What sources and forms of psychological pressure do elite athletes report before and during competition?

RQ2: What coping strategies and mental skills do elite athletes use to manage this pressure?

RQ3: How are these strategies associated with anxiety interpretation, psychophysiological stress responses, and performance readiness?

RQ1 contributes a consolidated map of pressure sources, RQ2 identifies the repertoire of regulation strategies used at the elite level, and RQ3 clarifies the mechanisms through which these strategies may translate into readiness to perform.

Method

Research Design and Framework

A systematic literature review (SLR) design was adopted because it offers a transparent, replicable, and structured approach to locating, appraising, and synthesising dispersed evidence (Tranfield et al., 2003). The review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021), building on the earlier PRISMA explanation and elaboration guidance (Liberati et al., 2009). Because the included evidence was expected to span qualitative, quantitative, and intervention designs, a narrative thematic synthesis was preferred over statistical pooling.

Review Framework and Search Strategy

The review question was structured with the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, Research type), which is recommended for syntheses of experiences and mixed-methods evidence where the intervention and comparison elements of PICO do not naturally apply (Cooke et al., 2012). The central aim was to understand how elite athletes experience and manage pressure, rather than to test a single intervention against a comparator. Each SPIDER element was translated into a cluster of keywords and synonyms (Table 1), which were combined into the Boolean string shown below.

Table 1. SPIDER framework and corresponding search terms

SPIDER element	Definition in this review	Search terms
Sample (S)	Elite, high-performance, professional, competitive, or Olympic athletes	"elite athlete", "high-performance athlete", "professional athlete", "competitive athlete", "Olympic athlete"
Phenomenon of Interest (PI)	Psychological pressure, stress, and competitive anxiety, and the strategies used to manage them	Pressure terms (e.g., "competitive anxiety", stress) combined with regulation terms (e.g., coping, "mental skill", mindfulness, imagery)
Design (D)	Qualitative, cross-sectional, longitudinal, mixed-methods, and intervention designs	Not restricted in the search string; applied at screening
Evaluation (E)	Stressors, appraisals, anxiety intensity and direction, coping use, psychophysiological markers, and readiness or performance indicators	Captured through the phenomenon terms; applied at screening
Research type (R)	Primary empirical research in a competitive context before or during competition	"pre-competition", precompetitive, competition, <i>championship</i> , tournament

The final Boolean search string executed in Scopus was as follows: TITLE-ABS-KEY (("elite athlete" OR "high-performance athlete" OR "professional athlete" OR "competitive athlete" OR "Olympic athlete") AND ("psychological pressure" OR "competitive anxiety" OR "performance anxiety" OR "sport anxiety" OR stress OR "psychological stress") AND (coping OR "coping strateg" OR "emotion regulation" OR

resilience OR "mental preparation" OR "mental skill*" OR mindfulness OR imagery OR "stress management") AND ("pre-competition" OR precompetitive OR competition* OR championship* OR tournament*))

The TITLE-ABS-KEY field code restricted retrieval to titles, abstracts, and keywords. Truncation with the asterisk captured variants (for example, athlete for athlete and athletes, and competition for competition and competitions). Synonyms were joined with OR and the four concept blocks with AND. No limiters were applied at the search stage to maximise sensitivity; year, language, and document type restrictions were applied during screening. The string was piloted, and broad terms such as stress were retained because narrower versions missed studies on competition stressors.

Database and Information Sources

Scopus was selected as the sole information source because of its broad coverage of sport science, psychology, and medicine and its consistent metadata export. The final search was executed on 15 September 2026, and no supplementary databases, registers, or other sources were used.

Eligibility Criteria

Eligibility criteria were defined a priori to keep the review focused on elite athletes' pressure experiences and regulation strategies (Table 2).

Table 2. Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Population	Elite, professional, Olympic or Paralympic, national or international-level, or high-performance athletes (samples may include non-elite comparison groups)	Recreational or non-athlete samples only; samples consisting only of coaches or staff
Phenomenon	Psychological pressure, stress, or competitive anxiety experienced before or during competition, together with coping, mental skills, or regulation strategies	Pressure unrelated to competition (for example, injury, illness, travel, or pandemic confinement) or no regulation component
Outcomes	Stressors, appraisals, anxiety intensity or direction, coping use, psychophysiological stress markers, or readiness and performance indicators	Physiological, immunological, or genetic outcomes without a psychological pressure component
Study design	Primary empirical studies (qualitative, quantitative, mixed-methods, or intervention)	Reviews, commentaries, editorials, letters, book chapters, and conference papers
Publication period	2005 to 2025	Before 2005 or after 2025
Language and source	English-language, peer-reviewed journal articles	Non-English publications and non-journal sources
Accessibility	Full text available	Full text not retrievable

Study Selection Process

Selection proceeded in three stages: duplicates were removed by comparing titles, authors, years, and digital object identifiers; titles and abstracts were screened against the eligibility criteria; and full texts of potentially relevant reports were assessed in detail. Two reviewers screened independently at each stage, resolving disagreements by discussion or, when needed, with a third reviewer. Agreement between reviewers at the full-text stage was quantified with Cohen's kappa (κ = [insert value from screening log]) and interpreted using the Landis and Koch (1977) classification.

Quality Appraisal

Methodological quality was appraised independently of the search framework with design-specific instruments (Table 3). Each study was classified by design, and every criterion of the matching tool was rated using the instrument's original response categories. The JBI critical appraisal checklists were used for qualitative, analytical cross-sectional, and quasi-experimental studies (Aromataris & Munn, 2020), the revised Cochrane risk-of-bias tool (RoB 2) was used for the randomised trial (Sterne et al., 2019), and the Mixed Methods

Appraisal Tool (MMAT) was used for the mixed-methods and non-randomised process-oriented studies (Hong et al., 2018).

Table 3. Critical appraisal tools applied according to study design

Study design	Critical appraisal tool	Included studies (n)
Randomised controlled trial	Cochrane Risk of Bias 2 (RoB 2)	1
Quasi-experimental (non-randomised intervention)	JBIChecklist for Quasi-Experimental Studies	1
Analytical cross-sectional	JBIChecklist for Analytical Cross-Sectional Studies	4
Qualitative	JBIChecklist for Qualitative Research	7
Mixed methods	Mixed Methods Appraisal Tool (MMAT), section 5	1
Non-randomised process-oriented (longitudinal)	Mixed Methods Appraisal Tool (MMAT), section 3	1

Consistent with MMAT guidance, no overall score was used as an exclusion threshold (Hong et al., 2018); criterion-level results were reported, and findings from studies with greater concerns were interpreted cautiously. Two reviewers appraised independently, resolved disagreements through discussion, and summarised agreement with Cohen's kappa (κ = [insert value]) using the Landis and Koch (1977) benchmarks.

Data Extraction Procedure

A standardised form recorded author(s), year, setting, design, sample, sport, competitive level, pressure sources, strategies or interventions, outcomes, and key findings. One reviewer extracted the data and a second verified the entries.

Descriptive Mapping of the Evidence

Because the number of included studies was small, network analysis was not considered informative. Instead, descriptive mapping summarised publication periods, study settings, and designs, and a study-by-strategy matrix visualised which pressure-management strategies each study reported.

Data Analysis and Synthesis

Data were synthesised using thematic synthesis (Thomas & Harden, 2008). Findings sections of the included studies were coded line by line, codes were grouped into descriptive themes, and these themes were then interpreted as analytical themes aligned with the three research questions. Given heterogeneous designs, quantitative results were narrated and integrated with qualitative themes rather than pooled. Themes were refined through reviewer discussion, with attention to agreements, contradictions, and study quality.

Reporting and Documentation

The review was reported in line with the PRISMA 2020 checklist and flow diagram (Page et al., 2021). The protocol was not registered, which is acknowledged as a limitation.

Results and Discussions

Study Selection Results

The Scopus search identified 217 records. After removing 12 duplicates, 205 records were screened by title and abstract, and 109 were excluded as clearly out of scope. Full texts were sought for 96 reports, 4 of which could not be retrieved. Of the 92 reports assessed, 77 were excluded: 31 did not examine competition-related pressure or its management, 18 did not involve elite or high-performance athletes, 17 were not primary empirical studies, and 11 were published outside the 2005 to 2025 window. Fifteen studies were included in the synthesis (Figure 1).

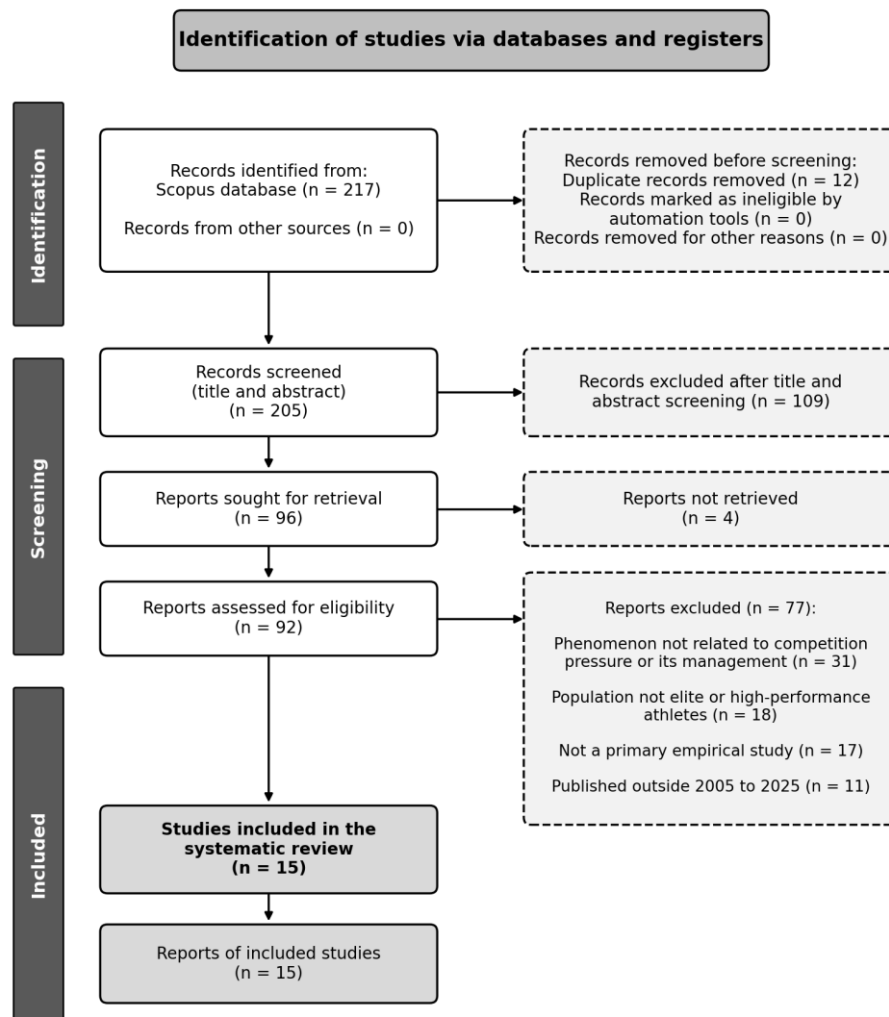


Figure 1. PRISMA 2020 flow diagram of the study identification, screening, and inclusion process (template adapted from Page et al., 2021)

Characteristics of the Included Studies

The 15 included studies were published between 2005 and 2025 (Table 4). Four studies appeared between 2005 and 2009 and six between 2020 and 2025 (Figure 2). Qualitative designs were the most common (n = 7), followed by cross-sectional surveys (n = 4), while one study each used a mixed-methods verbal report design, a longitudinal process-oriented design, a pilot randomised controlled trial, and a quasi-experimental design (Table 5).

The United Kingdom was the most frequent setting (n = 5), reflecting a programme of work on anxiety interpretation and competition stressors (Hanton et al., 2005; Mellalieu et al., 2009). Other studies came from North America, continental Europe, and Asia (Figure 3). Samples ranged from a single Paralympic athlete (Stratas et al., 2021) to 383 elite athletes (Nogueira et al., 2025) across team, combat, precision, equestrian, and cycling sports. Three studies compared elite with less skilled athletes (Neil et al., 2006; Kudlackova et al., 2013; Calmeiro et al., 2014).

Table 4. Summary of included studies

No	Title	Author(s)	Year	Country	Method	Key findings
1	Debilitative interpretations of competitive anxiety: A qualitative examination of elite performers	Hanton, Wadey, & Connaughton	2005	United Kingdom	Qualitative interviews (n = 6 elite athletes)	Debilitative interpretations began early in careers, became habitual, and reflected mental preparation, skills, coping, control, and confidence.
2	Psychological skills usage and the competitive anxiety response as a function of skill level in rugby union	Neil, Mellalieu, & Hanton	2006	United Kingdom	Cross-sectional survey (65 elite, 50 non-elite)	Elite players showed more facilitative interpretations, higher confidence, less relaxation, and more imagery and self-talk than non-elite players.
3	Basic psychological skills usage and competitive anxiety responses: Perceived underlying mechanisms	Wadey & Hanton	2008	United Kingdom	Qualitative semi-structured interviews (n = 15 elite athletes)	Athletes kept anxiety intensity but used goal setting, imagery, and self-talk to interpret symptoms as facilitative.
4	Competition stress in sport performers: Stressors experienced in the competition environment	Mellalieu, Neil, Hanton, & Fletcher	2009	United Kingdom	Qualitative interviews (6 elite, 6 non-elite)	Five performance and five organisational stressor categories emerged; performance stressors dominated before competing.
5	Young elite athletes and social support: Coping with competitive and organizational stress in "Olympic" competition	Kristiansen & Roberts	2010	Norway	Qualitative interviews and open-ended questionnaires (n = 29)	Event magnitude and logistical stressors were managed with cognitive coping and social support.

No	Title	Author(s)	Year	Country	Method	Key findings
6	Use of relaxation skills in differentially skilled athletes	Kudlackova, Eccles, & Dieffenbach	2013	United States	Cross-sectional survey (n = 150; three skill levels)	Professionals practised relaxation most; physical relaxation targeted competitive anxiety and mental relaxation everyday anxiety.
7	Managing pressure: Patterns of appraisals and coping strategies of non-elite and elite athletes during competition	Calmeiro, Tenenbaum, & Eccles	2014	United States	Mixed methods: verbal reports with sequential analysis (2 elite, 4 non-elite)	Elite shooters made fewer negative appraisals and coped with them, whereas non-elite shooters often did not cope.
8	Straight from the horse's mouth: Understanding professional event riders' mental preparation for maximising self-confidence prior to competition using thematic analysis	McGinn, Alcock, & Cameron	2018	United Kingdom	Qualitative interviews with thematic analysis (n = 5)	Riders relied on goal setting, routines, self-talk, imagery, and support teams to manage arousal and distraction.
9	The effects of mindfulness training on competition-induced anxiety and salivary stress markers in elite Wushu athletes: A pilot study	Mehrsafar et al.	2019	Iran	Pilot randomised controlled trial (n = 26)	Mindfulness reduced competitive anxiety and cortisol responses and increased self-confidence, with effects sustained at two months.
10	Dealing with elite sport competition demands: An exploration of the dynamic relationships between stress appraisal, coping, emotion, and performance during fencing matches	Doron & Martinent	2021	France	Longitudinal process-oriented design (two studies)	Coping and emotion mediated the dynamic links between stress appraisal and objective match performance.

No	Title	Author(s)	Year	Country	Method	Key findings
11	Which are the most determinant psychological factors in olympic shooting performance? A self-perspective from elite shooters	Moreira da Silva et al.	2021	Portugal/Spain	Qualitative interviews (n = 8)	Anxiety peaked before competition; psychological training, professional support, experience, and the coach supported performance.
12	An Interpretative Phenomenological Analysis of a Visually Impaired Athlete's Lived Experience with Competitive Stress at the 2016 Summer Paralympics	Stratas, Adam, & Pan	2021	Canada	Interpretative phenomenological analysis (n = 1)	Pressure arose before, during, and after events and was managed through self-care, mental skills, reduced inactivity, and support.
13	Starting in your mental pole position: Hypnosis helps elite downhill Mountainbike athletes to reach their optimal racing mindset	Hoffmann, Strahler, & Schmidt	2024	Germany	Quasi-experimental pre-post field study (n = 19)	Hypnosis lowered somatic anxiety and stress and raised self-confidence and heart rate variability; participants outperformed non-participants.
14	How the perfectionistic climate of a sports team predicts the athletic performance of elite athletes: A case study of the CUBAL women's basketball team	Meng et al.	2024	China	Cross-sectional structural equation modelling (n = 125)	Challenge stressors with positive coping predicted better performance; threat stressors with negative coping predicted poorer performance.
15	Emotional profile of athletes before competition: Contributions for perceived stress, cognitive appraisal and coping strategies	Nogueira, Morais, Mansell, & Gomes	2025	Portugal	Cross-sectional survey with cluster analysis (n = 383)	Profiles reported similar stress, but the facilitating arousal profile showed more challenge appraisal, control, and adaptive coping.

Note. Country refers to the setting of the sample or competition reported in each study.

Table 5. Classification of included studies by design, theme, and strategy

No	Author(s)	Year	Country	Research design	Theme/focus	Strategy or intervention	Outcome
1	Hanton et al.	2005	United Kingdom	Qualitative	Anxiety interpretation (RQ1, RQ3)	Mental preparation and psychological skills	Debilitative symptom interpretation
2	Neil et al.	2006	United Kingdom	Cross-sectional	Skill level and anxiety (RQ1, RQ2)	Imagery, self-talk, relaxation	Anxiety intensity, direction, self-confidence
3	Wadey & Hanton	2008	United Kingdom	Qualitative	Mechanisms of skills use (RQ2, RQ3)	Goal setting, imagery, self-talk, relaxation	Facilitative interpretation, perceived control
4	Mellalieu et al.	2009	United Kingdom	Qualitative	Competition stressors (RQ1)	Not applicable (stressor mapping)	Performance and organisational stressors
5	Kristiansen & Roberts	2010	Norway	Qualitative	Stress and support in youth Olympic event (RQ1, RQ2)	Cognitive coping, social support	Competitive and organisational stress
6	Kudlackova et al.	2013	United States	Cross-sectional	Relaxation practice by skill level (RQ2)	Relaxation, meditation, imagery, breathing	Relaxation use and functions
7	Calmeiro et al.	2014	United States	Mixed methods	In-competition appraisal and coping (RQ1, RQ2)	Problem-focused and emotion-focused coping	Appraisal and coping sequences, performance
8	McGinn et al.	2018	United Kingdom	Qualitative	Pre-competition mental preparation (RQ2)	Goal setting, routines, self-talk, imagery, support team	Self-confidence, arousal and distraction management
9	Mehrsafar et al.	2019	Iran	Pilot randomised controlled trial	Mindfulness intervention (RQ2, RQ3)	Eight-week mindfulness-based intervention	Competitive anxiety, self-confidence, cortisol, alpha-amylase
10	Doron & Martinent	2021	France	Longitudinal process-oriented	Dynamic stress processes (RQ3)	Coping behaviour and emotion	Objective match performance

No	Author(s)	Year	Country	Research design	Theme/focus	Strategy or intervention	Outcome
11	Moreira da Silva et al.	2021	Portugal/Spain	Qualitative	Psychological determinants (RQ1, RQ2)	Psychological training, professional support, coach role	Anxiety and performance perceptions
12	Stratas et al.	2021	Canada	Qualitative (IPA)	Para-athlete lived experience (RQ1, RQ2)	Self-care, mental skills, reduced inactivity, social support	Competitive stress experience
13	Hoffmann et al.	2024	Germany	Quasi-experimental	Hypnosis intervention (RQ2, RQ3)	Self-administered hypnosis audio	Anxiety, stress, self-confidence, HRV, race results
14	Meng et al.	2024	China	Cross-sectional (SEM)	Team climate as stressor (RQ1, RQ3)	Positive and negative coping	Athletic performance
15	Nogueira et al.	2025	Portugal	Cross-sectional (cluster analysis)	Pre-competition emotional profiles (RQ1, RQ3)	Adaptive and maladaptive coping	Stress, appraisal, perceived control

Note. SEM = structural equation modelling; IPA = interpretative phenomenological analysis; HRV = heart rate variability; RQ = research question addressed.

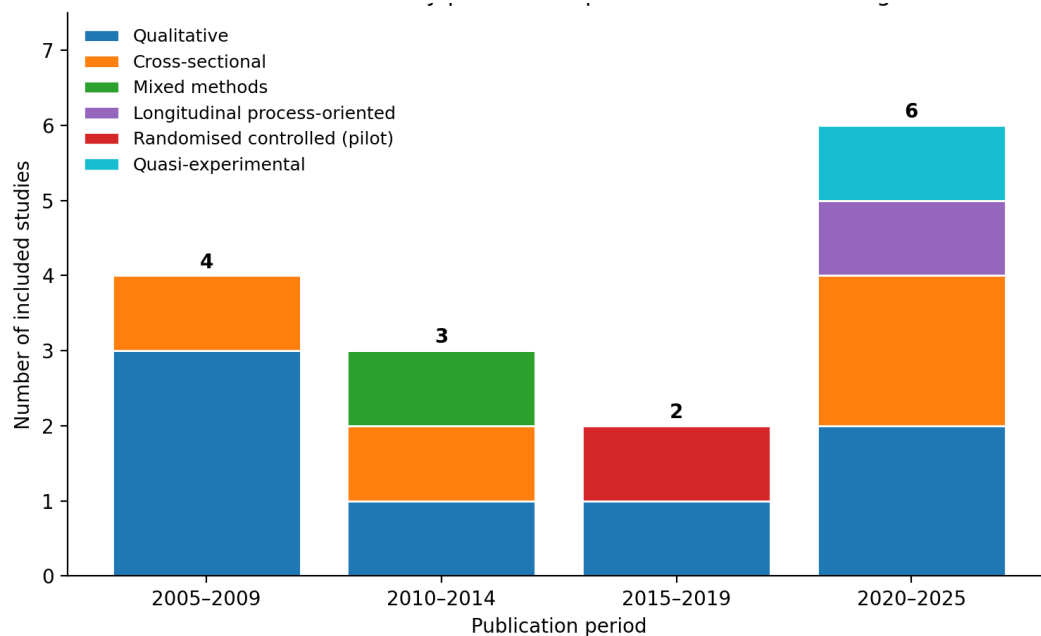


Figure 2. Distribution of included studies by publication period and research design

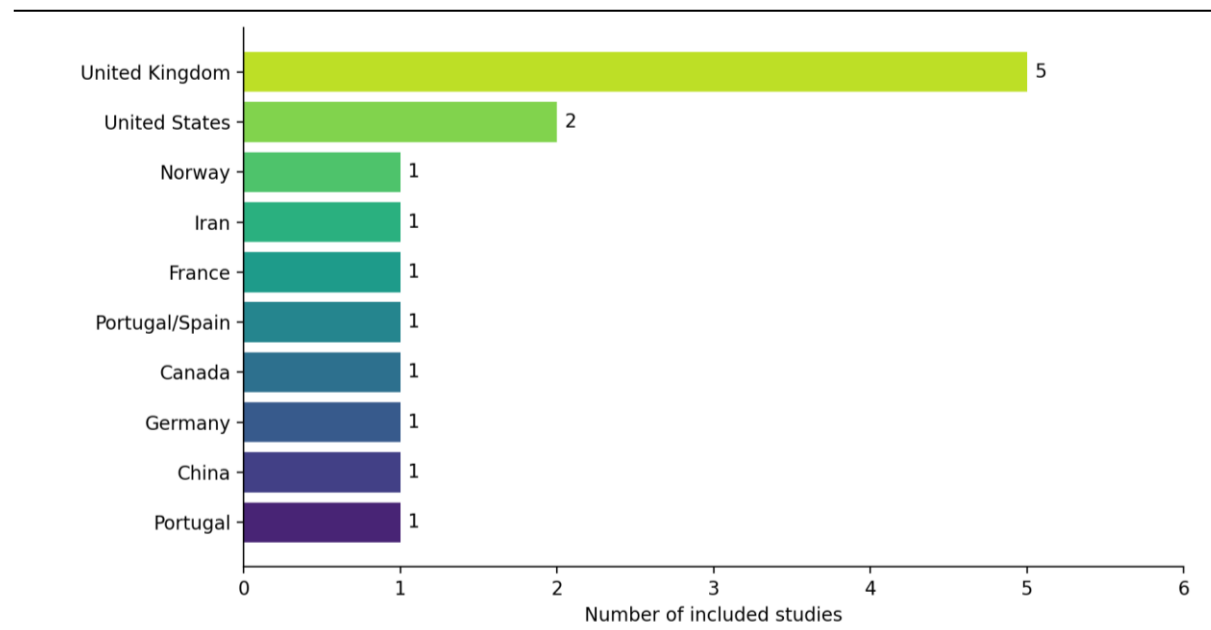


Figure 3. Geographic distribution of included studies by study setting

Methodological Quality of the Included Studies

Criterion-level appraisal results are shown in Table 6. Qualitative studies showed good congruence between questions, data collection, and analysis, but rarely reported researcher reflexivity (Hanton et al., 2005; Mellalieu et al., 2009). Cross-sectional studies used validated instruments, although confounding was seldom controlled (Neil et al., 2006; Meng et al., 2024). The pilot trial raised some concerns about allocation concealment and unblinded self-report outcomes (Mehrsafar et al., 2019), and the quasi-experimental study lacked a concurrent control group for psychological outcomes (Hoffmann et al., 2024). No study was excluded on quality grounds, but these limitations informed the weight given to findings.

Table 6. Quality appraisal results of the included studies

No	Author(s), Year	Study design	Appraisal tool	Criterion results	Overall interpretation
1	Hanton et al., 2005	Qualitative	JBİ Qualitative (Q1 to Q10)	U, Y, Y, Y, Y, N, N, Y, Y, Y	Moderate to high quality; reflexivity not reported
2	Neil et al., 2006	Cross-sectional	JBİ Analytical Cross-Sectional (Q1 to Q8)	Y, Y, Y, Y, N, N, Y, Y	Moderate quality; confounders not addressed
3	Wadey & Hanton, 2008	Qualitative	JBİ Qualitative (Q1 to Q10)	U, Y, Y, Y, Y, N, N, Y, Y, Y	Moderate to high quality; reflexivity not reported
4	Mellalieu et al., 2009	Qualitative	JBİ Qualitative (Q1 to Q10)	U, Y, Y, Y, Y, N, N, Y, Y, Y	Moderate to high quality; small matched sample
5	Kristiansen & Roberts, 2010	Qualitative	JBİ Qualitative (Q1 to Q10)	Y, Y, Y, Y, Y, N, U, Y, Y, Y	High quality
6	Kudlackova et al., 2013	Cross-sectional	JBİ Analytical Cross-Sectional (Q1 to Q8)	Y, Y, U, Y, U, N, U, Y	Moderate quality; bespoke survey instrument
7	Calmeiro et al., 2014	Mixed methods	MMAT section 5 (5.1 to 5.5)	Y, Y, Y, CT, Y	Moderate quality; very small sample

No	Author(s), Year	Study design	Appraisal tool	Criterion results	Overall interpretation
8	McGinn et al., 2018	Qualitative	JBİ Qualitative (Q1 to Q10)	U, Y, Y, Y, Y, N, N, Y, U, Y	Moderate quality; small sample, ethics reporting unclear
9	Mehrsafar et al., 2019	Randomised controlled trial (pilot)	RoB 2 (D1 to D5)	D1 SC, D2 SC, D3 L, D4 SC, D5 SC	Some concerns; unblinded self-report outcomes
10	Doron & Martinent, 2021	Non-randomised process-oriented	MMAT section 3 (3.1 to 3.5)	Y, Y, Y, CT, Y	Moderate to high quality
11	Moreira da Silva et al., 2021	Qualitative	JBİ Qualitative (Q1 to Q10)	U, Y, Y, Y, Y, N, N, Y, Y, Y	Moderate to high quality
12	Stratas et al., 2021	Qualitative (IPA)	JBİ Qualitative (Q1 to Q10)	Y, Y, Y, Y, Y, Y, U, Y, Y, Y	High quality; single case limits transferability
13	Hoffmann et al., 2024	Quasi-experimental	JBİ Quasi-Experimental (Q1 to Q9)	Y, U, U, N, N, Y, Y, Y, Y	Moderate quality; no concurrent control for psychological outcomes
14	Meng et al., 2024	Cross-sectional	JBİ Analytical Cross-Sectional (Q1 to Q8)	Y, Y, Y, Y, U, U, Y, Y	Moderate to high quality
15	Nogueira et al., 2025	Cross-sectional	JBİ Analytical Cross-Sectional (Q1 to Q8)	Y, Y, Y, Y, U, U, Y, Y	Moderate to high quality

Note. Y = yes; N = no; U = unclear; CT = can't tell; L = low risk; SC = some concerns; D1 to D5 = RoB 2 domains (randomisation, deviations from intended interventions, missing outcome data, outcome measurement, selection of reported result); IPA = interpretative phenomenological analysis.

Sources and Forms of Pre-Competition Pressure (RQ1)

Elite athletes encountered a dense and varied set of pressures before competition. Interviews with elite and non-elite performers identified five performance stressors (preparation, injury, expectations, self-presentation, and rivalry) and five organisational stressors, with performance-related demands outnumbering organisational ones before competing (Mellalieu et al., 2009). Organisational pressures became salient in large, unfamiliar events, where young Olympians described housing, transport, and extreme heat as amplifying competitive stress (Kristiansen & Roberts, 2010). A Paralympic medallist similarly described preparation, performance, and organisational pressures before, during, and after competition (Stratas et al., 2021). The team environment also emerged as a source of pressure, since a perfectionistic climate in elite women's basketball could be appraised either as a challenge or as a threat (Meng et al., 2024).

A second strand concerned the form in which pressure was experienced. Across studies, competitive anxiety rose during the pre-competitive period and fluctuated during performance (Moreira da Silva et al., 2021), yet the meaning athletes attached to their symptoms mattered more than their intensity. Elite rugby players reported more facilitative interpretations of anxiety than non-elite players despite similar intensity (Neil et al., 2006), whereas a minority of elite performers held persistently debilitating interpretations that had become habitual since early competitive experiences (Hanton et al., 2005). Elite shooters also reported fewer moment-to-moment negative appraisals than non-elite shooters (Calmeiro et al., 2014), and athletes with similar overall stress before major competition differed in how they interpreted their emotions (Nogueira et al., 2025). Pre-competition pressure is therefore best understood as an appraised experience rather than a fixed quantity of stress.

Coping Strategies and Mental Skills (RQ2)

Elite athletes rarely relied on a single strategy. The most frequently reported categories were social support and emotion-focused coping or reappraisal (each in five studies), followed by imagery, goal setting and planning, routines and attention control, and problem-focused coping (each in four studies), as shown in Figure 4. Qualitative evidence indicated that elite athletes used goal setting, imagery, and self-talk to maintain anxiety intensity while reframing symptoms as helpful (Wadey & Hanton, 2008). Professional event riders described

planning and preparation, including goal setting, time management, and pre-performance routines, together with self-talk and imagery to manage arousal, and relied on support teams to control distractions (McGinn et al., 2018). Elite shooters emphasised psychological training and professional support, and regarded the coach as playing a key role (Moreira da Silva et al., 2021).

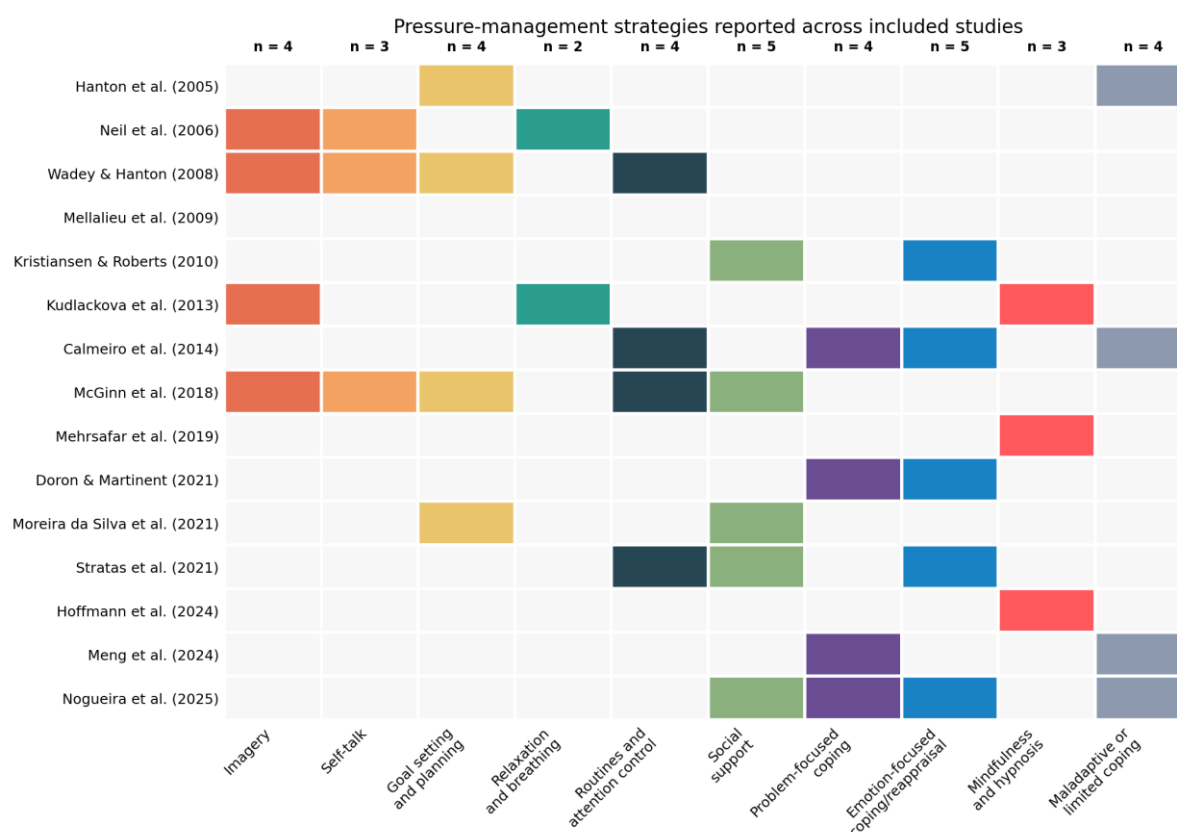


Figure 4. Study-by-strategy matrix of pressure-management strategies reported in the included studies (coloured cells indicate that the strategy was reported; n = number of studies)

Differences between skill levels were informative. Non-elite rugby players relied mainly on relaxation, while elite players combined imagery and self-talk with less relaxation (Neil et al., 2006). Conversely, professional athletes practised relaxation more than less skilled athletes, using physical techniques for competitive anxiety and meditation for everyday anxiety (Kudlackova et al., 2013). Young Olympians relied on cognitive coping and social support (Kristiansen & Roberts, 2010), and a Paralympian added self-care and minimising idle time before events (Stratas et al., 2021). Structured interventions extended this repertoire through mindfulness training (Mehrsafar et al., 2019) and self-administered hypnosis (Hoffmann et al., 2024). Maladaptive responses such as denial and negative coping were also documented (Meng et al., 2024; Nogueira et al., 2025).

Strategies, Anxiety Interpretation, and Performance Readiness (RQ3)

The evidence indicates that regulation strategies influence readiness primarily through appraisal and interpretation. Psychological skills were perceived to work by enhancing effort, attentional focus, and perceived control over anxiety (Wadey & Hanton, 2008). Athletes with a facilitating arousal profile reported greater challenge appraisals, perceived control, and adaptive coping (Nogueira et al., 2025), and challenge-related stress combined with positive coping predicted better basketball performance, whereas threat-related stress and negative coping predicted poorer performance (Meng et al., 2024). In international fencing, coping and emotion mediated the dynamic links between stress appraisal and objective performance (Doron & Martinent, 2021). Elite shooters also responded to negative appraisals with both problem-focused and emotion-focused coping, whereas non-elite shooters often proceeded without coping (Calmeiro et al., 2014).

Intervention studies added psychophysiological evidence. Mindfulness training increased self-confidence and mindfulness, reduced competitive anxiety, and lowered daily and competition-related salivary cortisol and alpha-amylase responses, with effects maintained at two months (Mehrsafar et al., 2019). Hypnosis reduced

somatic anxiety and subjective stress, increased self-confidence, and raised heart rate variability between two races, and participants tended to outperform non-participating elite riders (Hoffmann et al., 2024). However, links to objective performance were less consistent than links to anxiety and confidence, and performance effects of mindfulness remained untested (Mehrsafar et al., 2019).

Comparative and Critical Analysis of Methods

Methodologically, the field has moved from retrospective interviews and questionnaires towards process-oriented and intervention designs. Early UK studies described interpretation and skills use (Hanton et al., 2005; Wadey & Hanton, 2008), while recent studies introduced structural equation modelling (Meng et al., 2024), cluster analysis (Nogueira et al., 2025), repeated in-competition assessment (Doron & Martinent, 2021), and physiological markers (Mehrsafar et al., 2019; Hoffmann et al., 2024). Controlled designs remain rare, samples were often small, and female athletes, non-Western regions, and team-level processes were underrepresented (Stratas et al., 2021; Meng et al., 2024).

Interpretation of Findings

The central finding of this review is that pre-competition pressure is less a matter of how much stress athletes feel than of how they appraise and interpret it. This supports adaptation models in which stressor appraisal precedes coping and adjustment (Schinke et al., 2012; Wadey & Hanton, 2008). The dominance of performance stressors before competition (Mellalieu et al., 2009) mirrors the concentration of stressful experiences in the pre-competition phase among Winter Olympians (Pensgaard & Ursin, 1998), while organisational demands described in major events (Kristiansen & Roberts, 2010) echo earlier accounts of selection, leadership, and team issues in elite preparation (Noblet & Gifford, 2002; Woodman & Hardy, 2001). Pressure thus appears to be shared across the performance system (Thelwell et al., 2008).

The finding that elite athletes maintain anxiety intensity while interpreting symptoms as facilitative (Neil et al., 2006; Wadey & Hanton, 2008) suggests that expertise involves reframing rather than suppressing activation. This helps explain why a small group of elite performers can compete successfully despite habitual debilitating interpretations (Hanton et al., 2005), and why emotional profiles with similar stress levels diverge in their adaptive value (Nogueira et al., 2025). It also aligns with evidence that imagery and self-verbalisation distinguish superior performers (Mahoney & Avenier, 1977; Di Corrado et al., 2025).

Theoretical Implications

Theoretically, the synthesis supports a sequential yet recursive model linking pressure sources, appraisal, regulation strategies, and readiness (Figure 5). The challenge and threat pathways in elite basketball (Meng et al., 2024) and the mediating role of coping and emotion in fencing (Doron & Martinent, 2021) show that these links operate dynamically within competition. Coping also appears to be a flexible repertoire rather than a fixed style: approach tendencies (Anshel et al., 2000) and goal orientations (Pensgaard & Roberts, 2003) may predispose athletes to particular strategies, but elite performers combine problem-focused and emotion-focused coping as situations demand (Calmeiro et al., 2014; Nicolas et al., 2017). Evidence of communal coping (Mahot et al., 2026) and of team climate as a stressor (Meng et al., 2024) further suggests that individual models should incorporate shared appraisals.

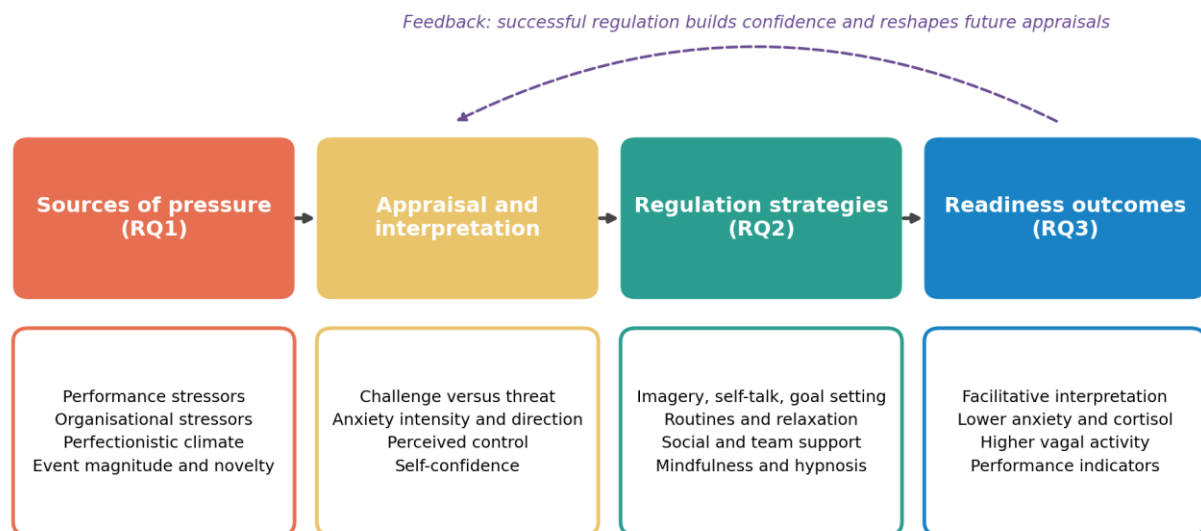


Figure 5. Integrated model of pre-competition pressure management in elite athletes derived from the synthesis

Practical Implications

Several practical implications follow. Mental preparation should target the interpretation of pre-competitive symptoms, teaching athletes to treat activation as a resource through imagery, self-talk, and goal setting (Wadey & Hanton, 2008; McGinn et al., 2018). Practitioners should also address organisational stressors such as logistics and environmental conditions before major events, especially for inexperienced athletes (Kristiansen & Roberts, 2010; Woodman & Hardy, 2001). Coaches can encourage challenge appraisals of demanding team climates by setting clear, achievable goals (Meng et al., 2024; Thelwell et al., 2008). Mindfulness, hypnosis, and breathing methods offer low-cost ways to reduce anxiety and physiological stress (Mehrsafar et al., 2019; Hoffmann et al., 2024; Chiron et al., 2025), and flexible formats such as audio-guided sessions may reach athletes with limited access to sport psychology services (Waite et al., 2022).

Comparison with Previous Reviews

These findings are broadly consistent with previous reviews. A recent scoping review of mindfulness in high-performance sport reported reduced stress, anxiety, and cortisol and increased confidence (Pereira et al., 2024), which matches the psychophysiological benefits observed here (Mehrsafar et al., 2019). Earlier reviews framed elite adaptation as involving appraisal, coping, and support (Schinke et al., 2012), and narrative work showed that adverse life events amplify competitive pressure (Souter et al., 2018). The present review extends this work by focusing on the pre-competition window and integrating qualitative and intervention evidence. It also complements clinical perspectives, since persistent anxiety beyond competition requires separate clinical attention (Walton et al., 2023).

Contradictions in the Literature

Some findings were not fully consistent. Elite rugby players used relaxation less than non-elite players (Neil et al., 2006), yet professional athletes reported more weekly relaxation than less skilled athletes (Kudlackova et al., 2013), possibly because relaxation also serves recovery and everyday anxiety. Frequent use of a strategy likewise did not guarantee effectiveness, as earlier cross-cultural work showed (Hoedaya & Anshel, 2003). Psychological benefits of interventions were consistent, but performance gains were untested (Mehrsafar et al., 2019) or based on non-randomised comparisons (Hoffmann et al., 2024), and breathing training has improved stress markers without changing performance (Chiron et al., 2025). Readiness and performance should therefore be treated as related but distinct outcomes.

Research Gaps

Three research gaps are evident. First, few studies captured pressure prospectively and in real time before competition, so the temporal sequence of appraisal, coping, and readiness remains inferred from retrospective or single-point data (Nicolas et al., 2017). Second, cultural diversity is limited, despite evidence that culturally specific attitudes shape how pressure is experienced (Casuga et al., 2017; Hoedaya & Anshel, 2003). Third,

controlled intervention studies with objective performance outcomes are scarce, and team-level regulation processes have received little attention (Mahot et al., 2026; Pereira et al., 2024).

Limitations of This Review

This review has several limitations. First, only Scopus was searched, and relevant studies indexed elsewhere may have been missed. Second, the restriction to English-language articles published between 2005 and 2025 may have excluded culturally informative and seminal studies (Hoedaya & Anshel, 2003; Pensgaard & Ursin, 1998). Third, heterogeneity in designs and measures precluded meta-analysis, so conclusions about effect size cannot be drawn. Fourth, the protocol was not registered, and the small number of intervention studies limits confidence in their generalisability.

Future Research Agenda

Future research should pursue at least three directions. Longitudinal and ecological momentary assessment designs should follow athletes from the days before competition through performance to test the proposed sequence (Doron & Martinent, 2021; Nicolas et al., 2017). Adequately powered randomised trials should compare mindfulness, hypnosis, imagery, and breathing interventions using both psychophysiological markers and objective performance (Chiron et al., 2025; Pereira et al., 2024). Studies should also include underrepresented regions, female and para-athletes, and team-level processes, and test accessible service delivery models (Aase et al., 2025; Waite et al., 2022).

Answers to the Research Questions

In answer to RQ1, elite athletes experience pre-competition pressure arising from performance demands, organisational conditions, event magnitude, and team climate, and this pressure is expressed mainly through the appraisal and interpretation of anxiety. In answer to RQ2, they manage pressure with a combined repertoire of imagery, self-talk, goal setting, routines, relaxation, social support, and problem-focused and emotion-focused coping, supplemented by mindfulness and hypnosis. In answer to RQ3, these strategies appear to promote readiness by fostering challenge appraisals, facilitative interpretations, confidence, and lower physiological stress, although their effects on objective performance require stronger evidence.

Conclusions

This systematic review shows that elite athletes face pre-competition pressure from performance demands, organisational conditions, event magnitude, and team climate, and that its impact depends largely on how anxiety is appraised and interpreted. They manage this pressure through a flexible combination of imagery, self-talk, goal setting, routines, relaxation, social support, and problem-focused and emotion-focused coping, while mindfulness and hypnosis can reduce anxiety and physiological stress. These strategies appear to enhance readiness mainly by fostering challenge appraisals, facilitative interpretations, and confidence. The review contributes an integrated model linking pressure sources, appraisal, regulation, and readiness that can guide individualised, appraisal-focused preparation and the management of organisational stressors before major events. Conclusions are limited by a single database, small samples, and few controlled trials, so future research should use longitudinal, culturally diverse, and randomised designs with objective performance outcomes.

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