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To cite this article: Rebecka Ekelund, Stefan Holmström, Henrik Gustafsson, Andreas Ivarsson, Carolina Lundqvist & Andreas Stenling (03 Nov 2023): Interventions for improving mental health in athletes: a scoping review, International Review of Sport and Exercise Psychology, DOI: [10.1080/1750984X.2023.2258383](https://doi.org/10.1080/1750984X.2023.2258383)

To link to this article: <https://doi.org/10.1080/1750984X.2023.2258383>



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Published online: 03 Nov 2023.



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Interventions for improving mental health in athletes: a scoping review

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ABSTRACT

The aims of this scoping review were to map the current literature on interventions for improving mental health in athletes, identify knowledge gaps, and generate future research questions. The Preferred Reporting Items for Systematic Review and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) guided this review. A systematic literature search was conducted in SPORTDiscus, PsycINFO, and SCOPUS and 44 intervention studies met the inclusion criteria. Results showed that 22 studies (50%) implemented cognitive behavioural principles, and the majority of these studies were influenced by various mindfulness programmes. Most studies (93%) included healthy athlete samples, and athletes aged 15–19 were the most examined age group (43%). Only three studies used clinical criteria in their sampling of participants and mediators were examined in two studies. The scarcity of studies examining mediators and subclinical or clinical samples revealed critical knowledge gaps in the literature. Furthermore, the critical appraisal showed that regardless of study design, most studies demonstrated low internal validity. We propose the use of high-quality single-case studies with athletes who experience subclinical or clinical mental health issues, and further investigation of mechanisms of change linking intervention components to outcomes of interest.

ARTICLE HISTORY

Received 23 March 2023

Accepted 3 September 2023

KEYWORDS

Well-being; mental health problems; mental disorders; treatment; sports

Introduction

The number of published studies focusing on athletes' mental health has steadily increased in recent years (Kegelaers et al., 2022; Ströhle, 2019), and several position and consensus statements have recently been published on the topic (Prior et al., 2022; Vella et al., 2021). Moreover, the results of prevalence studies on mental health, mental health problems, and mental disorders in athlete populations in the past decade (e.g.

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Gouttebarga et al., 2019), have highlighted athletes' need for effective mental health interventions.

Researchers have, however, questioned the existing evidence on mental health interventions for athletes and argued that the current evidence is insufficient to inform practice or policy (Prior et al., 2022). In light of this criticism, there is a need for a comprehensive mapping of the literature on psychological interventions for mental health in athletes to gain an in-depth understanding of the current knowledge base. Furthermore, a comprehensive mapping of the literature will identify critical knowledge gaps, which will guide future research and advance the knowledge base about mental health interventions for athletes.

Mental health, mental health problems, and mental disorders

Mental health is complex, and many different definitions grounded in different theoretical perspectives have been put forward in the literature (Lundqvist & Andersson, 2021). A frequently referred to definition of mental health is one proposed by the World Health Organisation (WHO). WHO defines mental health as 'a state of well-being that enables people to cope with the stresses of life, to realise their abilities, to learn well and work well, and to contribute to their communities' (WHO, 2022, p. 8). This definition emphasise functionality in life and that mental health is more than just the absence of mental ill-health.

Regarding theoretical perspectives, single-continuum models suggest that individuals move back and forth along a mental health–mental illness continuum (Chen et al., 2020). In the sport psychology literature, however, arguments against single-continuum models have been raised, because continuum models do not provide guidance on how to interpret symptoms of mental illness and whether these symptoms are natural reactions to adverse events in life or sport, or if the symptoms are indications of a clinical mental disorder (Lundqvist & Andersson, 2021; Lundqvist et al., 2022). Natural reactions in a sport setting, for example, could be a passing experience of performance anxiety before a competition or psychological distress during intensive training periods. To pose an alternative, Keyes (2002, 2005) argued that mental health and mental illness are not opposite ends of a single continuum but rather two distinct-but-related dimensions existing on two separate continua. By adopting the two continua model, we assume that athletes could experience good mental health and symptoms of mental illness simultaneously (Uphill et al., 2016). Although Keyes' two continua model of mental health (2002, 2005) provides a more comprehensive view of mental health than single-continuum models, the dual-continuum model also adds complexity and imposes challenges when interpreting the mental health of athletes (Lundqvist & Andersson, 2021). It is thus important to differentiate between natural, expected mental health states and symptoms of mental illness in need of treatment. To help differentiate expected fluctuations, problems, and disorders of mental health, two classification systems are in place: the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR; American Psychiatric Association, 2022) and the 11th revision of the *International Statistical Classification of Diseases and Related Health Problems* (ICD-11; World Health Organization, 2019). A *mental disorder* is a clinically significant disturbance in psychological functioning and is associated with psychological distress or impairment in social, occupational, or other essential activities (American Psychiatric Association, 2022). *Mental health problems*, on the other hand,

refers to subclinical psychological ill-being that may not necessarily develop into or fulfil the criteria of a clinical mental disorder.

For competitive athletes specifically, the differentiation between natural, expected mental health states and symptoms of mental illness might become a challenge due to the context in which they operate. What can be seen as functional in athletes' performance environment (e.g. excessive training, weight-control) might be considered dysfunctional in other settings and vice versa (Lebrun & Collins, 2017). Additionally, competitive athletes face sport specific stressors (e.g. fear of failure, deselection; Küttel & Larsen, 2020), organisational stressors (e.g. issues related to leadership, culture and team, logistics and environment, and performance; Arnold & Fletcher, 2012), physical and psychological demands (e.g. pressure to perform; Rice et al., 2016), and operate in performance environments to an extent that most non-competitive athletes (i.e. recreational athletes, general population) do not. For these reasons, one must be careful to avoid pathologising natural human experiences, due to the potential consequences of falsely diagnosing normal suffering and potentially overtreating or stigmatising someone. At the same time, one must not disregard psychiatric issues and thereby withhold appropriate treatment from someone who needs it (Wakefield & First, 2013).

Interventions for mental health

Interventions, in psychological practice, refers to assessment, diagnosis, prevention, treatment, psychotherapy, and consultation (American Psychological Association [APA], 2006), and several empirically supported interventions for mental health are available (see APA Division 12 (n.d.) for an overview). Interventions for improving athletes' mental health may therefore include promotion of mental health (e.g. Birrer et al., 2021), prevention strategies (e.g. Becker et al., 2012), or treatment (i.e. clinical interventions, psychotherapy) of mental health problems and disorders (e.g. Lundqvist, 2020).

A few previous studies have attempted to synthesise the literature on mental health interventions for athletes. Kegelaers et al. (2022) conducted a systematic scoping review on studies of the mental health of student-athletes, which also included intervention studies. The results from the intervention studies were, however, merely described and not examined or discussed in depth. Moreover, the review provided no future directions of research or considerations specifically about mental health interventions for student-athletes. Sutcliffe et al. (2021) performed a systematic review and meta-analysis of sport-based interventions focused on mental health and mental health literacy in non-elite sport (i.e. athletes, coaches, or parents). However, the sport-based interventions included both psychological and non-psychological interventions (e.g. acupuncture; Luetmer et al., 2019), and the synthesis was conducted on reported outcomes of mental health problems and mental health literacy, not intervention characteristics specifically. The meta-analyses showed small or undetectable effects of interventions on anxiety, psychological distress, and well-being, whereas no statistically significant effects of the interventions on depression were found (Sutcliffe et al., 2021).

Prior et al. (2022), on the other hand, focused on competitive sport in their systematic scoping review on interventions, recommendations, and policy concerning athletes' mental health. Although interventions are reported in the review, the authors did not provide information about how mental health outcomes were operationalised, map

theories underpinning the interventions, or specify whether mediators were included (Prior et al., 2022), which are key pieces of information to understand the current evidence for mental health interventions for athletes (Herzog et al., 2022).

Though previous studies (e.g. Kegelaers et al., 2022; Prior et al., 2022; Sutcliffe et al., 2021), in different ways, have provided valuable insights and increased our understanding of mental health interventions in athletes, questions remain concerning the theories underpinning interventions, the effective mechanisms of change, and the study quality. Hence, a scoping review targeting psychological interventions for improving mental health in athletes (regardless of competition level) will add to the synthesis of knowledge about mental health interventions for athletes, highlight current knowledge gaps, and provide several directions for future intervention research.

The current study

Researchers have indicated the limited availability of studies on the effectiveness of interventions for athletes' mental health (e.g. Ekelund et al., 2022; Stillman et al., 2019). For this reason, a comprehensive scoping review would benefit from aiming to capture the whole spectrum of intervention research rather than limiting its scope to one specific subgroup of athletes or excluding key aspects of interventions (e.g. theory, mediators, operationalisation). A scoping review is most suitable for such a comprehensive mapping and summary (Arksey & O'Malley, 2005; Grant & Booth, 2009) aimed at identifying knowledge gaps and generating future research questions rather than informing policy (Munn et al., 2018).

The main aim of this scoping review was to map existing evidence of interventions (i.e. promotion, prevention, or treatment) for improving athletes' mental health and to identify knowledge gaps to facilitate new questions that will guide future research. The review's secondary aims were to outline: (a) the theories/models on which the mental health interventions for athletes were based; (b) the type of treatment used in such interventions; (c) the way in which mental health was defined and operationalised/measured in such interventions; (d) the mediators examined in the studies reviewed; and (e) the athlete populations most commonly researched. Finally, each study was critically appraised to evaluate the quality of the current literature.

Method

Approach, protocol, and registration

For this scoping review, we adopted the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews checklist (PRISMA-ScR; Tricco et al., 2018). Additionally, in line with recommendations specifically for scoping reviews within sport and exercise psychology (Sabiston et al., 2022), a group of experts, consisting of three of the co-authors (CL, HG, and AI) was involved to assist in specifying the research questions, search terms, and eligibility criteria. A study protocol was developed using the PRISMA-ScR (Tricco et al., 2018). The original protocol was approved by all authors and preregistered on the Open Science Framework on 22 February 2022 (<https://osf.io/cbtgm/>). Minor edits to the study protocol were conducted up until 12 December 2022.

Eligibility criteria

To be included in this review, articles needed to be peer-reviewed, written in English, and report either observational (i.e. pre/post design) or controlled studies (non-randomised and randomised trials). Additionally, the review included studies that involved competitive athletes and implemented an intervention focused on improving athletes' mental health (i.e. prevention or promotion) or treating their mental health problems/disorders, as defined by the authors of each individual study in their research aims.

Studies were excluded if they: (a) had no available full text; (b) focused solely on performance enhancement/had only performance enhancement as a dependent variable; (c) were grey literature; (d) investigated non-competitive athletes (i.e. recreational sport participants); (e) implemented interventions that indirectly targeted athletes (e.g. coach or parental education programmes, team building interventions); (f) were case studies; or (g) did not report quantitative data (e.g. studies relying solely on qualitative data). Finally, studies were excluded if their reported outcomes pertained to competitive states (e.g. performance anxiety, mental readiness, irrational beliefs) solely in relation to performance and not mental health.

Information sources and search strategy

Two electronic searches were conducted. The first search was conducted on 23 February and 10 March 2022, and a second complementary search was conducted on 15 February 2023, covering work published between February 2022 and 15 February 2023. Both searches included three electronic databases: SPORTDiscus, PsycINFO, and SCOPUS. A professional librarian was consulted throughout the processes of developing a search strategy. A broad search strategy was adopted, and database searches included three search blocks (mental health, context, and intervention) with the search terms ('mental health' OR 'mental illness' OR 'mental ill-being' OR 'mental health problems' OR 'mental disorders' OR 'well-being' OR 'psycho*') AND ('sport' OR 'athlete*') AND ('intervention*' OR 'treatment*' OR 'therap*'). All electronic search results were imported to EndNote, where duplicates were removed.

The electronic searches were supplemented with a manual search of reference lists from the included studies in the current study and we also examined studies included in previously published reviews focused on mental health in athletes (i.e. Breslin et al., 2022; Kegelaers et al., 2022; Prior et al., 2022; Rice et al., 2016; Stillman et al., 2019; Sutcliffe et al., 2021). In addition, the *Journal of Clinical Sport Psychology* (vol. 1) and the *Journal of Sport and Exercise Psychology* (vols. 1 through 9) were searched manually because these two journals did not have all volumes indexed in any of the databases included in this review.

Selection of sources of evidence

The open-source machine-learning tool ASReview was employed to support the title and abstract screening of the records identified in the electronic searches (see van de Schoot et al., 2021, for more information). In ASReview, articles are manually marked by the

researcher as relevant or irrelevant. Based on these classifications, ASReview ranks articles in order of relevance. A mixed strategy (i.e. a combination of pre-determined strategy and data-driven strategy) for stopping criteria was used. A *pre-determined* strategy is when screening stops after a minimum percentage of articles are screened. With a *data-driven* strategy, screening stops after a certain amount of consecutive irrelevant articles.

For this review, the pre-determined stopping criterion was set to a minimum of 33% of articles, based on the recommendations of van de Schoot et al. (2021) and Howard et al. (2020). The data-driven strategy was set to 1% of the whole dataset (i.e. 210 consecutive irrelevant articles in the first search and 22 consecutive irrelevant articles in the complementary search). Both criteria had to be fulfilled before the screening stopped. Once the stopping criteria were fulfilled, the remaining non-validated articles were classified as irrelevant automatically by ASReview (Ros et al., 2017). When 33% of the articles from the first search had been screened, the last 1,007 articles in the initial title and abstract screening were marked as irrelevant; in the complementary screening, it was the last 189 articles.

The first author (RE) performed the title and abstract screening in ASReview. Following this, the results from the screening in ASReview were downloaded in an Excel file, where articles were ranked in order of relevance by ASReview (see <https://osf.io/cbtgm/> for the full details on screening in ASReview). When it became evident that the duplicate removal by EndNote was not complete, duplicates and clearly irrelevant papers among the articles marked as relevant were screened for in the Excel file. RE screened the titles among the articles marked as irrelevant in the Excel file, to check for potential missing relevant articles. No missing relevant articles were found.

Thereafter, relevant articles were imported into Rayyan (an online programme for managing systematic reviews; Ouzzani et al., 2016) for additional manual title and abstract screening. Two of the co-authors (RE and SH) independently conducted the manual title and abstract screening. Discrepancies (9.9% of the articles) were resolved by reading the abstract again, reaching a consensus decision based on the inclusion and exclusion criteria, and, when needed, further discussion with a third co-author (AS). At this stage, articles reporting on non-psychological interventions (e.g. ice baths, acupuncture, dietary modifications, massage therapies) were excluded. Following this, the first author completed a full text screening of articles that were deemed eligible.

In the manual search, the first author screened titles and abstracts, and completed a full text screening of articles. Thereafter, RE, SH, and AS discussed and reached consensus decisions regarding potentially eligible articles based on the inclusion and exclusion criteria.

Data charting process

Data from eligible studies were charted in a data-charting form. The form included relevant information on the key characteristics of each study. RE independently charted data from all potentially eligible studies while AS independently charted data from 30% of the potentially eligible studies. No disagreements were found. Finally, RE, SH, and AS critically discussed the findings and determined the final inclusion of studies.

Data items and collection process

We extracted data on article characteristics (i.e. year of publication and country of origin), characteristics of the study population (i.e. sport, gender, age, and competition level), study characteristics (i.e. design, type of intervention, measurement used, dependent variables, identification of theory, intervention facilitator, procedural reliability or treatment integrity, and mediators), and key findings.

Critical appraisal

Critical appraisal is a key feature in reviews that systematically assess the quality of the included studies and it helps readers determine the credibility of the results (Tod et al., 2022). Studies with a group-based design were critically appraised with the Mixed Methods Appraisal Tool (MMAT) Version 2018 (Hong et al., 2018). The MMAT is used to assess different methodological qualities of various study designs (e.g. quantitative randomised controlled trials [RCTs] and quantitative non-randomised studies) and each study design is judged by five specific criteria. Methodological quality criteria for RCTs are (a) Is randomisation appropriately performed? (b) Are the groups comparable at baseline? (c) Are there complete outcome data? (d) Are the outcome assessors blinded to the intervention provided? and (e) Did the participants adhere to the assigned intervention? For quantitative non-randomised studies following methodological quality criteria was judged (a) Are the participants representative of the target population? (b) Are measurements appropriate regarding both the outcome and intervention (or exposure)? (c) Are there complete outcome data? (d) Are the confounders accounted for in the design and analysis? and (e) During the study period, is the intervention administered (or exposure occurred) as intended? Each criterion of the MMAT is rated as 'Yes', 'No', or 'Can't tell'.

For single-case designs, the Risk of Bias in N-of-1 Trials Scale (RoBiNT; Tate et al., 2015) was used. The RoBiNT consist of two subscales, one to assess internal validity and the other to assess external validity. The internal validity subscale includes seven items (i.e. design with control, randomisation, sampling of behaviour, blinding of people involved in the intervention, blinding of assessor(s), interrater agreement, and treatment adherence), whereas the external validity subscale includes eight items (i.e. baseline characteristics, setting, dependent variable, independent variable, raw data record, data analysis, replication, and generalisation). Each item is rated on a 3-point scale (0-2), hence, the possible maximum combined score when using the RoBiNT is 30 points.

RE and SH independently appraised all studies with a quasi-experimental design. Mixed-methods designs were critically appraised based on their quantitative method. All included mixed-methods studies were independently critically appraised as quasi-experimental designs by RE and SH. RE and AS independently appraised all RCTs and single-case studies. Disagreements between the authors resulted from a lack of clarity in reporting in the reviewed studies. In case of disagreement, the reviewed article was further examined by a pair of co-authors (RE and SH for quasi-experimental studies, RE and AS for RCT and single-case studies) to resolve ambiguity and reach consensus.

Synthesis of results

Interventions were categorised by the type of underpinning model or theory. More specifically, we categorised interventions as focusing either on cognitive behavioural therapy (CBT), stress, motivation, or other. Mindfulness and acceptance-based interventions were categorised in the CBT category, as these are strongly embedded in the CBT tradition (Hayes, 2004; Hayes & Hofmann, 2017). Note, however, that the categorisation based on the underpinning model or theory was purely data-driven (i.e. not based on an existing framework) and was intended to provide a broad overview of the main models and theories underpinning the included studies.

Results

Characteristics of sources of evidence

Sources of evidence that were screened, assessed for eligibility, and included in the review can be found in Figure 1, as can any reasons for exclusion. The type of intervention, sample, design, outcomes, measures, mediators, and key findings of each study are summarised and presented in Table 1. The definition of mental health used in each study and the theory, framework, or model underpinning the interventions (as described and cited by the studies' authors) are summarised in Table 2.

Intervention characteristics

Face-to-face intervention delivery was used in 34 of the 44 intervention studies. Five studies used a hybrid mode of delivery that combined face-to-face elements with either structured, self-based work, or digital components. Three studies were conducted solely online or without face-to-face interaction, and the mode of intervention delivery was unclear

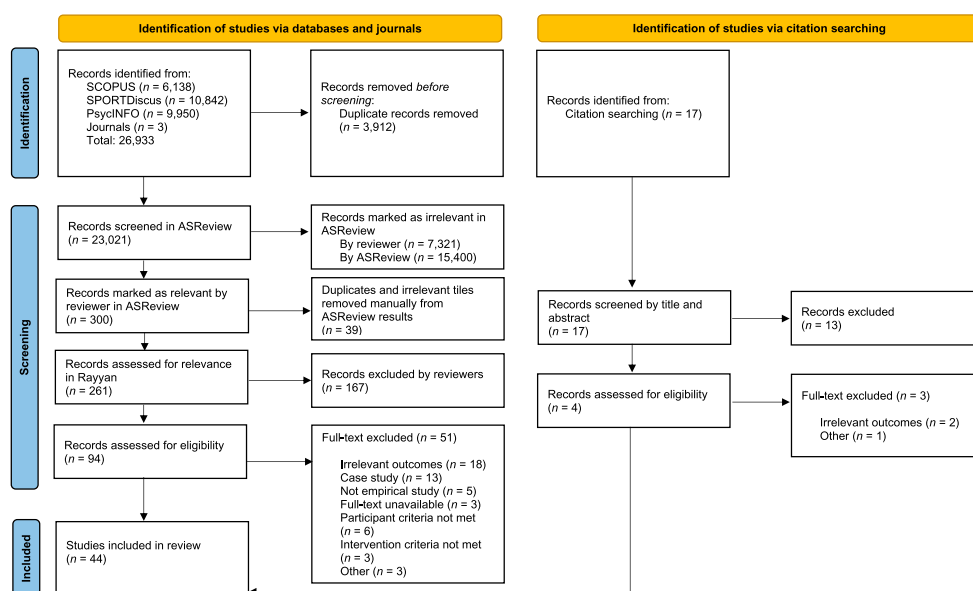


Figure 1. PRISMA flow diagram (Page et al., 2021).

Table 1. Study summary.

Author(s) and year of publication	Intervention	Participants	Study characteristics	Outcomes assessed	Measures	Mediators	Key findings
Belz et al. (2020)	One 90-minute face-to-face group stress-prevention workshop	69 m, 29 f $M_{\text{age}} = 15.5$	Design: RCT Sport: Soccer	Perceived stress, depression, psychological well-being	PSS PHQ-2 WHO-5	No	No intervention effect on perceived stress, depression, or psychological well-being.
Bertollo et al. (2021)	Sport psychological intervention (SPI) online: webinar, workshops, and four 2-hour group sessions weekly	10 m, 28 f $M_{\text{age}} = 25.1$	Design: Quasi-experimental Sport: Cycling	Emotional, social, and psychological well-being	Sport MHC-SF ITAMS SF-12	No	The SPI improved psychological well-being, but not emotional or social well-being, for intervention participants compared to controls.
Çakmakçı et al. (2020)	CBT intervention: 21 sessions over 16 weeks	5 m, 11 f $M_{\text{age}} = 20$	Design: Quasi-experimental Sport: Various	Signs of bulimia nervosa	EDDS SCID-I	No	During the intervention, signs of bulimia nervosa decreased and were maintained to follow-up; no changes were observed in the control group.
Carraça et al. (2019a)	Mindfulness-based soccer program (MBSoccerP): nine 90–120-minute, face-to-face group sessions over 8 weeks	57 m $M_{\text{age}} = 25.8$	Design: Quasi-experimental Sport: Soccer	Psychological flexibility, self-compassion	AAQ-II SCS	No	Self-compassion increased from pre- to post intervention, and psychological inflexibility decreased.
Carraça et al. (2019b)	Mindfulness-based soccer program (MBSoccerP): nine 90–120-minute, face-to-face group sessions over 8 weeks	57 m $M_{\text{age}} = 25.7$	Design: Quasi-experimental Sport: Soccer	Psychological flexibility, self-compassion, psychological distress, thought suppression	AAQ-II SCS BSI WBSI	No	Self-compassion increased from pre- to post intervention, and psychological inflexibility, anxiety, and thought suppression decreased.
Chandler et al. (2020)	Resilience training model: 10 hourlong, face-to-face group sessions over 5 weeks	47 m, 15 f $M_{\text{age}} = 18.2$	Design: Mixed methods Sport: Various	Perceived stress	PSS	No	The intervention group reported significantly lower levels of perceived stress than the control group did.

(Continued)

Table 1. Continued.

Author(s) and year of publication	Intervention	Participants	Study characteristics	Outcomes assessed	Measures	Mediators	Key findings
Chen et al. (2019)	Mindful sport performance enhancement (MBSE): four 2.5–3-hour face-to-face group sessions over four weeks	21 m $M_{\text{age}} = 26.4$	Design: Quasi-experimental Sport: Baseball	Depression, anxiety, eating disorders	PHQ-9 BAI EDE-Q	No	MBSE did not statistically significantly improve anxiety and depression but did significantly improve global EDE-Q score and marked shape and weight concerns from baseline to 1-month follow-up.
Chervencova et al. (2015)	Multidisciplinary intervention: face-to-face individual physical therapy, training in shooting, and psychological sessions over 9 days	4 m, 5 f $M_{\text{age}} = 37.5$	Design: Quasi-experimental Sport: Shooting	Positive affect, negative affect, state anxiety, trait anxiety	PANAS STAI-Y	No	A decrease in trait anxiety and negative affect was observed in the tested athletes. No changes for state anxiety and positive affect were observed.
Coelho et al. (2012)	Multimodal imagery: three 25-minute, face-to-face group sessions weekly over 9 weeks	46 m $M_{\text{age}} = 17$	Design: Quasi-experimental Sport: Tennis	State anxiety, stress	CSAI PSS	No	Cognitive anxiety and perceived stress significantly improved for the intervention group but not for controls.
Dallmann et al. (2016)	Stress prevention program: six 30-minute, face-to-face group sessions over 6 weeks	16m, 40f $M_{\text{age}} = 16.9$	Design: Quasi-experimental Sport: Various	Perceived stress	TICS	No	No intervention effect on perceived stress was found.
Donohue et al. (2018)	The Optimum Performance Program in Sports (TOPPS): 12 face-to-face sessions of 62–96 minutes over 4 months	38m, 36 f $M_{\text{age}} = 20.6$	Design: RCT Sport: Various	Axis 1 diagnosis (DSM-IV), mental health, depression	SCID-IV GSI BDI-II	No	Participants in TOPPS improved in overall mental health and depression up to 8 months post intervention compared to control group.
Dowell et al. (2021)	RISE multicomponent development program: four 2.5-hour monthly face-to-face group sessions over 5 months	74 m $M_{\text{age}} = 12–15$ (range)	Design: Quasi-experimental Sport: Rugby	Anxiety, depression	RCADS-25	No	Anxiety significantly declined; a trend-level reduction in depression was observed from pre- to post program. No differences between the two intervention groups were observed.

Dubuc-Charbonneau and Durand-Bush (2015)	Self-regulation intervention: seven to nine biweekly, 40–60-minute, individual face-to-face sessions	4 m, 4 f $M_{age} = 20.2$	Design: Mixed methods Sport: Various	Burnout, stress, well-being	ABQ PSS WEMWBS	No	Levels of burnout and stress significantly decreased, while well-being significantly increased.
Evers et al. (2021)	Mindfulness intervention: over 4 weeks, four face-to-face or digital group sessions of self-based work	7 m, 22 f $M_{age} = 20$	Design: Quasi-experimental Sport: Various	Perceived stress, mental health	PSS SF-12	No	Mental health improved post intervention; no statistically significant decrease in perceived stress for intervention participants was observed.
Fogaca (2021)	Coping intervention: over 5 weeks, five 50-minute, face-to-face group sessions for athletes and team captains; four such sessions for team captains only	43 m, 45 f $M_{age} = 19.8$	Design: Quasi-experimental Sport: Various	Anxiety, depression, psychological quality of life	BAI BDI WHOQOL	No	Anxiety significantly improved for the intervention group compared to the control group. Neither group experienced significant changes in depression and psychological quality of life.
Gabana et al. (2019)	One 90-minute, face-to-face, Attitude of Gratitude group workshop	27 m, 24 f $M_{age} = 19.8$	Design: Quasi-experimental Sport: Various	Psychological distress, burnout, life satisfaction	BSI-18 ABQ SWLS	No	Psychological distress and burnout decreased from baseline to follow-up. The workshop had no significant effect on life satisfaction.
Gabana et al. (2022)	The Athlete Gratitude Group (TAGG), a positive psychology intervention of six hourlong, face-to-face group sessions over 8 weeks	18 f $M_{age} = 16.6$	Design: Quasi-experimental Sport: Soccer	Mental health	MHC-SF	No	Compared to the athletes-only intervention group, the intervention group with a coach present significantly improved in mental health across all time points from baseline to follow-up.

(Continued)

Table 1. Continued.

Author(s) and year of publication	Intervention	Participants	Study characteristics	Outcomes assessed	Measures	Mediators	Key findings
Glass et al. (2019)	Mindfulness Sport Performance Enhancement (MSPE): six 75-minute, face-to-face group sessions	8 m, 44 f $M_{\text{age}} = 19.3$	Design: RCT Sport: Various	Depression, anxiety, stress, life satisfaction and subjective well-being, psychological inflexibility, sport anxiety	DASS SWLS AAQ-II SAS	No	The MSPE had no statistically significant effect on primary outcomes for participants in the first round of intervention. When the control group later received the intervention, significant decreases in depression were observed from pre- to post intervention.
Goodman et al. (2014)	Mindfulness and yoga intervention: eight face-to-face, 90-minute, Mindfulness-Acceptance-Commitment (MAC) approach group sessions immediately followed by 1-hour yoga session over 5 weeks	26 m $M_{\text{age}} = 20.2$	Design: Quasi-experimental Sport: Not reported	Psychological inflexibility, perceived stress, psychological distress	AAQ-II PSS DASS	No	No differences in mental health outcomes between the intervention group and the control group were observed post intervention.
Gross et al. (2018)	Mindfulness-Acceptance-Commitment approach (MAC) intervention: six weekly hourlong face-to-face group sessions	22 f $M_{\text{age}} = \text{not reported}$	Design: RCT Sport: Basketball	Psychological distress, psychological flexibility, emotion regulation	CCAPS-62 AAQ-II DERS	No	The MAC intervention reduced emotion dysregulation compared to the PST intervention. Reduced generalised anxiety and psychological distress, and increased psychological flexibility was observed from post intervention to 1 month follow-up in the MAC group.
Haney (2004)	Stress-management intervention: six 90-minute, face-to-face group sessions over 6 weeks	47 f $M_{\text{age}} = 24.4$	Design: RCT Sport: Various	Anxiety	STAI	No	Both interventions reduced anxiety from pre- to post treatment. The relaxation group showed a greater reduction in anxiety than did the cognitive group from pre- to post treatment. From

Jones et al. (2020)	Mindfulness-based stress reduction (MBSR): eight 75-minute, face-to-face group sessions over 9 weeks	27 m $M_{\text{age}} = 18\text{--}23$ (range)	Design: Quasi-experimental Sport: Rowing	Anxiety, depression, perceived stress, rumination, psychological well-being	BAI BDI-II PSS RRS WBS EWBSS	No	immediately post treatment to follow-up, the anxiety levels of the cognitive group remained stable, whereas those of the relaxation group increased. Composite psychological well-being score significantly improved in the MBSR group, but not in the control group.
Kouali et al. (2020)	Imagery intervention: eight individual, 15–25-minute, face-to-face sessions over 10 weeks	5 f $M_{\text{age}} = 19.8$	Design: Multiple-baseline single-case design Sport: Soccer	Eudaimonic well-being	MHC-SF CORE-10 SWEMWBS	No	For two of the five participants, a small increase in EWB was observed.
Laslett and Uphill (2020)	Dual interventions: therapeutic letter-to-self, values targeting (individual, digital, self-based work)	2 m, 2 f $M_{\text{age}} = 23.2$	Design: Multiple-baseline single-subject design and multiple-probe design Sport: Various	Mental health, mental illness, mental well-being	MHC-SF CORE-10 SWEMWBS	No	From baseline to follow-up, an increase in and maintenance of mental health and a decrease in mental illness was observed via visual analysis of the three participants who completed the study.
Laureano et al. (2014)	Experiential learning program: six hourlong, face-to-face group sessions over 2 weeks	76 (gender not reported) $M_{\text{age}} = 18.9$	Design: Quasi-experimental Sport: Rugby	Psychological well-being	AFM-2	No	From pre- to post intervention, psychological well-being (i.e. overall happiness and positive affect) significantly increased, whereas negative affect significantly decreased. No changes in psychological well-being were observed for the control group.

(Continued)

Table 1. Continued.

Author(s) and year of publication	Intervention	Participants	Study characteristics	Outcomes assessed	Measures	Mediators	Key findings
Laurin et al. (2008)	Goal-setting and Personal Goal Management program (PGMP): hourlong face-to-face interviews (one group, four individuals) over 4 months	22 m $M_{age} = 17.5$	Design: Quasi-experimental Sport: Soccer	Mood	POMS	No	Post intervention, the intervention group reported higher levels of positive moods and lower levels of negative mood than the control group did.
Macdougall et al. (2019)	Mindfulness-Acceptance-Commitment program (MAC) with a motivational interviewing framework: eight individual, hourlong, face-to-face weekly sessions	5 m, 13 f $M_{age} = 32.5$	Design: RCT Sport: Various parasport	Subjective well-being, psychological well-being, social well-being, experiential acceptance	SPANE SWLS PWB Social well-being questionnaire AAQ-II	No	Significant improvement in subjective and psychological well-being was observed in the MAC group. The intervention had no effect on social well-being and experiential acceptance.
McCarthy et al. (2010)	Goal setting intervention of self-based work: one 30-minute face-to-face session and distribution of psychoeducational booklets; brief individual discussions on all training sessions during the intervention with intervention provider	3 f $M_{age} = 12-13$ (range)	Design: Multiple-baseline single-case design Sport: Track and field	Positive affect, negative affect	PANAS	No	Intervention participants showed a statistically significant increase in positive affect but not in negative effect.
Moesch et al. (2020)	Mindfulness- and acceptance-based intervention: four individual, hourlong, face-to-face sessions; ten-minute home-directed web-based exercises twice daily over 8 weeks.	2 m, 4 f $M_{age} = 26$	Design: Multiple-baseline single-case design Sport: Various	Well-being, anxiety, depression	WHO-5 PHQ-4 SAAQ	No	The intervention had a statistically significant effect on well-being for two participants. No effects on anxiety and depression were observed.
Mohammed et al. (2018)	Mindfulness-Based Stress Reduction (MBSR): eight 90-minute, individual, face-to-face sessions over 8 weeks	14 m, 6 f $M_{age} = 28.8$	Design: Quasi-experimental Sport: Various	Mood, depression, anxiety, stress	POMS DASS	No	Positive mood, depression, anxiety, and stress did not significantly change in the MBSR group.

Mosewich et al. (2013)	Self-compassion intervention: initial group session followed by individual writing modules, once a day for 7 days; face-to-face, home-directed, self-based work	51 f $M_{age} = 20.3$	Design: RCT Sport: Various	Self-compassion, state rumination, state self-criticism	SCS Three questions on state rumination Seven items on state self-criticism	No	The self-compassion intervention demonstrated an effect on management of self-criticism and rumination.
Ning et al. (2022)	Mindfulness Acceptance Insight Commitment (MAIC), seven weekly, 60–90-minute, face-to-face group sessions	24 m, 23 f $M_{age} = 22.3$	Design: RCT Sport: Swimming	Anxiety, depression	POMS	No	Anxiety and depression significantly decreased in the MAIC group compared to controls and were maintained at 10 weeks post intervention.
Ofoegbu et al. (2020)	Digital storytelling and rational emotive behaviour therapy (REBT): weekly individual and group 90-minute, face-to-face sessions for 12 weeks; digital, self-based work	111 m, 60 f $M_{age} = 20.4$	Design: RCT Sport: Various parasport	Burnout	ABQ	No	Compared to waitlist controls, the intervention group had significantly reduced burnout thoughts from pre- to post intervention, a result maintained to follow-up.
Perna et al. (1998)	Cognitive Behavioural Stress Management program (CBSM): seven 45-minute face-to-face group sessions, using audiotapes, over 4 weeks	18 m, 22 f $M_{age} = 19.2$	Design: Quasi-experimental Sport: Rowing	Mood	BAM	Fatigue Total mood disturbance	The intervention group experienced a significant reduction in depressed mood.
Podlog et al. (2020)	Cognitive behavioural therapy (CBT) intervention: four weekly, individual, hourlong, face-to-face sessions; home assignments	4 m, 12 f $M_{age} = 19.9$	Design: Quasi-experimental Sport: Various	Positive affect Negative affect Vitality	PANAS SVS	No	Compared to controls, athletes in the CBT group displayed significantly higher positive affect and vitality mid- and post intervention and lower levels of negative affect at post intervention.
Sandgren et al. (2022)	Motivational and psychoeducational self-help program for athletes with mild eating disorder symptoms (MOPED-A): 60–90 minutes of individual, home-directed,	8 m, 27 f $M_{age} = 27.1$	Design: Mixed methods Sport: Various	Eating disorder symptoms	EDE-Q	No	Eating disorder symptoms were significantly reduced after MOPED-A and were further reduced or maintained at follow-up.

(Continued)

Table 1. Continued.

Author(s) and year of publication	Intervention	Participants	Study characteristics	Outcomes assessed	Measures	Mediators	Key findings
Sekizaki et al. (2017)	self-based work per week for 6 weeks Internet-based cognitive behavioural therapy (iCBT): one 180-minute group session plus 4 weeks of individual iCBT (face-to-face and digital self-based work)	80 m M_{age} = not reported	Design: Quasi-experimental Sport: Various	Psychological distress Mental health problems	K6 GHQ-12	No	The iCBT intervention did not change levels of psychological distress or mental health problems for participants in the intervention group, while controls showed significantly exacerbated psychological distress.
Shannon et al. (2019)	The State of Mind Ireland (SOMI) intervention: two 90-minute group workshops and 14 daily individual, 5–20-minute, home-directed sessions of self-based work (face-to-face and digital self-based work)	137 m, 101 f M_{age} = 20.5	Design: Quasi-experimental Sport: Various	Well-being	WEMWBS	Mindfulness Competence satisfaction Stress	The intervention did not directly affect the mediator mindfulness, resulting in no indirect effects on well-being. However, the intervention was effective at directly improving competence satisfaction, which resulted in indirect effects on mindfulness, stress, and well-being.
Smith and Petrie (2008)	Cognitive dissonance-based intervention: three weekly face-to-face group sessions with home assignments	29 f M_{age} = 19.3	Design: Quasi-experimental Sport: Various	Thin-ideal internalisation, body image concerns, negative affect, disordered eating	BAA-R BPSS-R BSQ-10-R PANAS-X BULIT-R DRES	No	No treatment effect was identified.
Stewart et al. (2019)	The Female Athlete Body (FAB) project: three weekly 80-minute face-to-face group sessions	481 f M_{age} = 19	Design: RCT Sport: Various	Eating disorder symptoms, thin-ideal internalisation, positive affect, negative affect	EDE-Q EDE IBSS-R ISTI PANAS-X	No	Reduced dietary restraint, fewer objective and subjective binge episodes, lower thin-ideal internalisation, and increased BMI at follow up

Stranberg et al. (2020)	Walden GOALS program (multidisciplinary intervention): 18 three-hour face-to-face group and individual sessions over 6 weeks	15 f $M_{age} = 20.9$	Design: Quasi-experimental Sport: Various	Eating disorder symptoms	EDE-Q DSM-V	No	for the FAB group, compared to control teams. EDE-Q scores declined. No athlete scored in the clinical eating disorder range at discharge.
Vidic et al. (2018)	Mindfulness meditation intervention: six hourlong face-to-face group sessions over 9 weeks	18 m $M_{age} = 19.6$	Design: Mixed methods Sport: Soccer	Perceived stress	PSS	No	No statistically significant effect of the intervention on perceived stress emerged.
Waters et al. (2022)	RISE multicomponent development program: four 30–40-minute, face-to-face group workshops	251 m $M_{age} = 12–15$ (range)	Design: Quasi-experimental Sport: Rugby	Anxiety, depression	RCADS-25	No	RISE improved depression but not anxiety for high-risk participants, compared to controls.
Wong et al. (2022)	Mindfulness-Acceptance-Commitment (MAC) approach: seven weekly 50-minute face-to-face group sessions	2 m, 3 f $M_{age} = 15$	Design: Single-case A-B design Sport: Squash	Experiential avoidance, perceived stress	AAQ-II PSS	No	The MAC intervention did not improve levels of perceived stress and experiential avoidance.

Note. (A-)POMS = (Abbreviated) Profile of Mood States; (S)WEMWBS = (Short) Warwick-Edinburgh Mental Well-Being Scale; AAQ-II = Acceptance and Action Questionnaire; ABQ = Athlete Burnout Questionnaire; AFM-2 = Affectometer-2; BAA-R = Belief About Attractiveness Scale-Revised; BAI = Beck Anxiety Inventory; BAM = Brief Assessment of Mood; BDI-II = Beck Depression Inventory II; BPSS-R = Body Part Satisfaction Scale-Revised; BSQ-10-R = Body Shape Questionnaire-Revised; BSI = Brief Symptom Inventory; BSI-18 = Behavioral Symptom Inventory-18; BULIT-R = Bulimia Test-Revised; CCAPS-62 = Counseling Center Assessment of Psychological Symptoms-62; CORE-10 = Clinical Outcomes in Routine Evaluation-10; CSAI = Competitive State Anxiety Inventory; DASS = Depression Anxiety and Stress Scale; DERS = Difficulties in Emotion Regulation Scale; DRES = Dutch Restrained Eating Scale; DSM-V = Diagnostic and Statistical Manual of Mental Disorders, fifth edition; EDDS = Eating Disorder Diagnostic Scale; EDE = Eating Disorder Examination interview; EDE-Q = Eating Disorder Examination-Questionnaire; GHQ-12 = General Health Questionnaire-12; GSI = Global Severity Index of Symptom Checklist 90 – revised; IBSS-R = Ideal-Body Stereotype Scale-Revised; IES = Impact of Event Scale; ISTI = Sport-Specific Thin-Ideal scale; ITAMS = Italian Mood Scale; K6 = Kessler-6 Scale; MHS-SF = Mental Health Continuum - Short Form; PANAS(X) = Positive and Negative Affect Schedule (Expanded); PHQ = Patient Health Questionnaire; PSS = Perceived Stress Scale; PWB = Psychological Well-Being scale; EWBS = Eudaimonic Well-Being in Sport Scale; RCAD-25 = Revised Children's Anxiety and Depression Scale; RRS = Ruminative Responses Scale; SAS = Sport Anxiety Scale; SCID-I = Structured Clinical Interview for DSM-IV (Axis I disorders); SCS = Self-Compassion Scale; SF-12 = 12-Item Short Form Health Survey; SPANE = Scale of Positive and Negative Experiences; Sport MHC-SF = Sport Mental Health Continuum – Short Form; STAI = State-Trait Anxiety Inventory; STAI-Y = The State-Trait Anxiety Inventory – Form Y; SVS = Subjective Vitality Scale; SWLS = Satisfaction With Life Scale; TICS = Trier Inventory for the Assessment of Chronic Stress; WBSI = White Bear Suppression Inventory; WHO-5 = World Health Organization - Five Well-Being Index; WHOQOL = World Health Organization Quality of Life questionnaire.

in one study. Furthermore, 24 interventions were group-based, 10 studies conducted interventions on individual bases, eight studies used a combination of group-based and individual work, and two studies did not clearly indicate whether their respective interventions were group-based or individual. Regarding intervention facilitator, a wide variety of actors were used (e.g. clinical psychologist, master level psychology student, doctoral students, mental performance consultant, resident physician, sport psychologist, athletic trainer). Regarding the length of the interventions, group-based interventions ranged from one 90-minute session (Belz et al., 2020; Gabana et al., 2019) to 18 three-hour sessions over six weeks (Stranberg et al., 2019). Individual interventions ranged from one 30-minute session (with additional individual self-work; McCarthy et al., 2010) to 21 sessions over 16 weeks (Çakmakçı et al., 2020). For further details on intervention characteristics, see Table 1.

Theories, frameworks, and models

All but four studies reported either a theory or model that was underpinning their intervention. Half of all identified studies ($n = 22$) based their intervention on some type of CBT. Of the 22 CBT-based studies, 14 employed some type of mindfulness intervention (e.g. MBSR, MAC, MSPE). Four studies were categorised as a stress intervention, whereas two studies combined stress with either CBT or motivation theories. A motivation theory or model (i.e. self-determination theory, competence motivation theory, achievement goal theory, or personal goal management programme) was used in five studies. Additionally, seven studies could not be categorised and were guided by pedagogy (i.e. experiential learning), positive psychology, community-based participatory framework, or eudaimonic and psychological well-being. Finally, four studies could not be categorised because they reported no underpinning theory or framework. For details, see Table 2.

Definition and operationalisation of mental health

The majority of studies ($n = 36$) did not explicitly define mental health, whereas eight studies did. Of these eight studies, four used Keyes's (2002) two continua model to define mental health (Bertollo et al., 2021; Laslett & Uphill, 2020; Ning et al., 2022; Shannon et al., 2019). In addition, Bertollo et al. (2021), and Laslett and Uphill (2020) also included the WHO's definition of mental health. Three studies used various dimensions of well-being (i.e. hedonic, eudaimonic, subjective) to define mental health (Dubuc-Charbonneau & Durand-Bush, 2015; Kouali et al., 2020; Maccougall et al., 2019). Mental health was also defined as a fluctuating affective state characterised by the presence of positive affect and the absence of negative affect (Laurin et al., 2008).

Various aspects of anxiety were most frequently used to operationalise mental health, with 12 studies using this approach. Mental health was operationalised via measures of well-being, stress, and depression in 12 studies, whereas eight studies included mood and affect in their operationalisation, seven included psychological (in)flexibility or experiential avoidance, and five included outcomes related to eating disorders. Five studies included measures of psychological distress as an outcome. Four studies used a global measure of mental health, whereas self-compassion, burnout, and life satisfaction/quality of life were each included in three studies. Two studies included rumination as an indicator of mental health, and another two included global measures of mental illness or mental health problems as outcomes. Self-criticism, vitality, thought suppression, DSM diagnosis, and emotional regulation were included as outcomes in one study each. For details, see Table 1.

Table 2. Descriptive summary of definitions, theories, frameworks, and models.

Author(s) and year of publication	Definition of mental health	Theory or model underpinning intervention	Category
Belz et al. (2020)	Not reported	The transactional model of stress and coping ¹	Stress
Bertollo et al. (2021)	WHO's definition of mental health ² Keyes' two continua model of mental health ³	Ecological framework ⁴ , rational emotive behavioural therapy ⁵	CBT
Çakmakçı et al. (2020)	Not reported	Cognitive behavioural therapy, rational emotive behavioural therapy ⁶	CBT
Carraça et al. (2019a)	Not reported	Mindfulness stress reduction, acceptance and commitment, compassionate mind training models	CBT
Carraça et al. (2019b)	Not reported	Mindfulness stress reduction program ⁷ , acceptance and commitment program ⁸ , compassionate mind training ⁹	CBT
Chandler et al. (2020)	Not reported	Self-determination theory ¹⁰	Motivation
Chen et al. (2019)	Not reported	Mindful sport performance enhancement ¹¹	CBT
Chervencova et al. (2015)	Not reported	Not reported	None
Coelho et al. (2012)	Not reported	Not reported	None
Dallmann et al. (2016)	Not reported	Not reported	Stress
Donohue et al. (2018)	Not reported	Family behaviour therapy ¹² , positive psychology ¹³	Other
Dowell et al. (2021)	Not reported	Community-based participatory framework ^{14, 15}	Other
Dubuc-Charbonneau and Durand-Bush (2015)	Well-being with hedonic ¹⁶ and eudaimonic dimensions ^{17, 18}	Cognitive-affective stress-based burnout model ¹⁹ , resonance performance model ²⁰	Stress, motivation
Evers et al. (2021)	Not reported	Mindfulness-based stress reduction ⁷	CBT
Fogaca (2021)	Not reported	The transactional model of stress and coping ¹	Stress
Gabana et al. (2019)	Not reported	Broaden-and-build theory of positive emotions ²¹	Other
Gabana et al. (2022)	Not reported	Gratitude group program ²²	Other
Glass et al. (2019)	Not reported	Mindful Sport Performance Enhancement ^{23, 24}	CBT
Goodman et al. (2014)	Not reported	Mindfulness acceptance commitment approach program ²⁵	CBT
Gross et al. (2018)	Not reported	Mindfulness acceptance commitment approach program ²⁵	CBT
Haney (2004)	Not reported	Stress-inoculation program ^{26, 27} , progressive relaxation intervention ²⁸	Stress
Jones et al. (2020)	Not reported	Mindfulness-based stress reduction ²⁹	CBT
Kouali et al. (2020)	Subjective and eudaimonic well-being ²⁰	Self-determination theory ³⁰	Motivation
Laslett and Uphill (2020)	WHO's definition of mental health ³¹ Keyes' conceptualisation of emotional, social, and psychological well-being ³²	Theoretically aligned with the development of emotional and psychological well-being	Other
Laureano et al. (2014)	Not reported	Experiential learning ³³	Other
Laurin et al. (2008)	Well-being as a fluctuating affective state ³⁴ involving the presence of positive affect and the absence of negative affect ^{35, 36}	Personal goal management programs approach ^{37, 38}	Motivation
Maccougall et al. (2019)	Global well-being ³⁹ , integrated with dimensions of hedonia and eudaimonia ^{40, 41, 20}	Mindfulness acceptance commitment approach ²⁵ , motivational interviewing ⁴²	CBT

(Continued)

Table 2. Continued.

Author(s) and year of publication	Definition of mental health	Theory or model underpinning intervention	Category
McCarthy et al. (2010)	Not reported	Competence motivation theory ⁴³ , achievement goal theory ⁴⁴	Motivation
Moesch et al. (2020)	Not reported	Mindfulness-based stress reduction ⁴⁵ , acceptance and commitment therapy ⁴⁶	CBT
Mohammed et al. (2018)	Not reported	Mindfulness-based stress reduction	CBT
Mosewich et al. (2013)	Not reported	Mindful Self-Compassion program ⁹	CBT
Ning et al. (2022)	Keyes' two continua model of mental health ⁴⁷	Mindfulness acceptance insight commitment ⁴⁸	CBT
Ofoegbu et al. (2020)	Not reported	Rational emotive behaviour therapy	CBT
Perna et al. (1998)	Not reported	Cognitive behavioural stress management program	CBT, stress
Podlog et al. (2020)	Not reported	Cognitive behavioural therapy	CBT
Sandgren et al. (2022)	Not reported	Motivational interviewing, cognitive behavioural therapy	CBT
Sekizaki et al. (2017)	Not reported	Cognitive behavioural therapy	CBT
Shannon et al. (2019)	Well-being as a state of optimal functioning ⁴⁹ Keyes' two continua model of mental health ⁵⁰	Self-determination theory ¹⁰	Motivation
Smith and Petrie (2008)	Not reported	Dissonance theory ⁵¹	CBT
Stewart et al. (2019)	Not reported	Not reported	None
Stranberg et al. (2020)	Not reported	Motivational interviewing, cognitive behavioural therapy, dialectical behavioural therapy	CBT
Vidic et al. (2018)	Not reported	Not reported	None
Waters et al. (2022)	Not reported	Community-based participatory framework ⁵²	Other
Wong et al. (2022)	Not reported	Mindfulness acceptance commitment approach ²⁸	CBT

Note: ¹Lazarus & Folkman (1984), ²WHO (2014), ³Keyes (2002), ⁴Purcell et al. (2019), ⁵Turner et al. (2020), ⁶Turner (2016), ⁷Kabat-Zinn (2003), ⁸Gardner & Moore (2012), ⁹Neff & Germer (2013), ¹⁰Ryan & Deci (2000), ¹¹Kaufman et al. (2009), ¹²Azrin et al. (1994), ¹³Seligman & Csikszentmihalyi (2000), ¹⁴Trickett (1996), ¹⁵Zeldin et al. (2013), ¹⁶Diener & Lucas (1999), ¹⁷Ryan & Deci (2001), ¹⁸Searle (2008), ¹⁹Smith (1986), ²⁰Newburg et al. (2002), ²¹Fredrickson (2004), ²²Wong et al. (2017), ²³Kaufman et al. (2016), ²⁴Kaufman et al. (2018), ²⁵Gardner & Moore (2007), ²⁶Meichenbaum (1985), ²⁷Long (1984), ²⁸Bernstein & Borkovic (1973), ²⁹Kabat-Zinn (1982), ³⁰Deci & Ryan (1985), ³¹WHO (2013), ³²Keyes (2007), ³³Kolb & Kolb (2005), ³⁴Fujita & Diener (2005), ³⁵Diener et al. (2002), ³⁶Lent (2004), ³⁷Gollwitzer (1993), ³⁸Nuttin (1985), ³⁹Lundqvist (2011), ⁴⁰Macdougall et al. (2016), ⁴¹Lundqvist & Sandin (2014), ⁴²Bricker & Tollinson (2011), ⁴³Harter (1978, 1981), ⁴⁴Nicholls (1984, 1989), ⁴⁵Kabat-Zinn (1994), ⁴⁶Hayes et al. (1999), ⁴⁷Keyes (2012), ⁴⁸Gangyan (2014), ⁴⁹Ryan & Deci (2017), ⁵⁰Keyes (2005), ⁵¹Festinger (1957), ⁵²Minkler & Wallerstein (2008)

Mediators

Two of the 44 intervention studies examined mediators. Perna et al. (1998) investigated the mediating effect of fatigue and total mood disturbance on mood during heavy training in a cognitive behavioural stress management programme (CBSM). In Shannon et al. (2019), mindfulness, competence satisfaction, and stress were investigated as mechanisms of change in a mental health intervention that applied self-determination theory to promote well-being, reduce stress, and increase competence in mental health self-management.

Athlete population

Participants' mean age ranged from 12 to 37.5 years across the included studies. The most common age group recruited was that of athletes between the ages of 15 and 19 years ($n = 19$). Thirteen studies recruited samples whose mean ages ranged from 20 to 24 years. Samples of athletes in the 25-to-30 age range were used in seven studies, three studies

used samples of athletes under the age of 15, and two studies used samples with mean ages above 31.

Most studies ($n = 21$) recruited athletes from various sports. Seven studies recruited from soccer, three studies recruited from rugby, two studies recruited from rowing, and two from various parasports. The remaining studies included athletes competing in cycling, baseball, shooting, tennis, swimming, squash, basketball, and track and field, and one study did not report the type of sport practiced by its participants.

Three studies explicitly screened for and required clinical cut-off values as inclusion criteria. Sandgren et al. (2022) included participants who self-reported having mild symptoms of eating disorders, and a confirmed eating disorder diagnosis was required for inclusion in two studies (Çakmakçı et al., 2020; Stranberg et al., 2019).

Critical appraisal

Of the 44 studies identified, 24 were quasi-experimental, 10 were RCTs, five were mixed-methods, and five employed a single-case design. Raw scoring and details of the critical appraisal can be found in Appendix A.

Quasi-experimental studies

The critical appraisal of the 29 quasi-experimental studies (24 quasi-experimental and five mixed methods) showed sufficient quality of the representative sample of the target population as well as appropriate measurements of outcome and intervention for all studies. However, only 11 studies provided complete levels of outcome data, whereas nine studies did not, and it was not possible to assess levels of complete outcome data for nine studies. Furthermore, only one study accounted for confounding variables in their design and analysis, 25 did not, and it was unclear whether the remaining three studies included confounding variables.

Only two studies were determined to have administered their interventions as intended, without contamination or unplanned co-interventions. As for the remaining studies, 20 did not clearly indicate whether their interventions had been administered as intended, and seven studies did not deliver their interventions as intended (without contamination or unplanned co-interventions).

Randomised controlled trials

The critical appraisal of the 10 RCTs showed that four studies appropriately reported and performed randomisation. All RCTs but two had comparable groups at baseline, and only four studies reported complete outcome data. Two studies had blinded outcome assessors, three studies did not, and it was unclear in five studies whether outcome assessors were blinded to the intervention. Finally, three studies had an acceptable participant adherence to the intervention, two did not, and it was unclear whether adherence to the intervention had been sufficient in the remaining five studies.

Single-case studies

Three studies scored 1 out of 14 possible points on the internal validity scale and two studies scored 2 out of 14 points on the internal validity scale. The scores on the external

validity scale ranged from 4 to 10 out of 16 possible points. The total score among the single-case studies ranged from 5 to 12 out of 30 points.

Discussion

State of the knowledge base

Interventions for improving athletes' mental health generally seem to be effective. However, to understand the current evidence, it is important to consider what populations have been studied. Healthy athletes aged 15–19 were the most examined group of athletes, thus demonstrating a trend towards intervening for mental health, regardless of the presence of mental health issues or not. The three studies that did recruit clinical populations (i.e. athletes experiencing subclinical mental health problems and/or clinical mental disorders; Çakmakçı et al., 2020; Sandgren et al., 2022; Stranberg et al., 2019) all focused on eating disorders, and their initial results seem promising.

Regarding treatment studies, there is a general lack of evidence regarding the effectiveness of interventions on clinical levels of mental health outcomes, such as anxiety and depression as defined by the DSM-5-TR (American Psychiatric Association, 2022). The practice of targeting clinical outcomes that may not be present in the sample can be problematic. First, by doing so, the study's authors indirectly attribute to the participants a condition (e.g. depression) that might not need to be addressed to begin with. Second, an intervention that, for example, targets symptoms of depression in a sample where symptoms of depression are not of clinical relevance cannot indicate whether the intervention is effective for the treatment of depressive symptoms. Regarding promotion and prevention of mental health, it can be of interest to investigate the occurrence of mental health outcomes, although the sample may not be expected to show any greater levels of mental health problems. Hence, the targeting of appropriate samples, combined with a clear operationalisation of mental health for each intervention study, is crucial for the interpretation of the intervention's aim and effectiveness.

The findings of this review highlight the field of sport psychology's struggles with operationalisations and definitions of mental health in intervention studies. For example, seven different measures were used to assess anxiety. Similar findings of multiple operationalisations of the same construct have emerged elsewhere (Sutcliffe et al., 2021; Tahtinen et al., 2021), and researchers have argued that it is unlikely that the field of sport psychology will coalesce around a uniform definition and operationalisation of mental health outcomes (Lundqvist & Andersson, 2021). Consequently, potential confusion arises about the targeted constructs in intervention research when mental health is operationalised in many ways or is not clearly defined.

Moreover, this review shows that mental health interventions for athletes to date are strongly influenced by various cognitive behavioural approaches – especially elements of third wave CBT (e.g. mindfulness- and acceptance-based interventions). Third wave therapies aim to be transdiagnostic (i.e. targeting underlying mechanisms that are thought to drive and maintain ill-health rather than treating symptoms in isolation; Hayes & Hofmann, 2017) and have shown promising results in studies targeting common mental health issues, such as anxiety, depression, and eating disorders (Dimidjian et al., 2016). That these well-established approaches are guiding interventions for athletes'

mental health is promising, and the field of sport psychology would benefit from continuing in this direction.

Knowledge gaps

This review highlights critical knowledge gaps in current sport psychology research on interventions for athletes with subclinical or clinical mental health issues. These gaps align with previous findings showing that intervention studies with samples of athletes experiencing clinical mental health issues are scarce (Ekelund et al., 2022; Stillman et al., 2019). Untreated clinical issues such as depressive symptoms or major depressive disorder may result in personal suffering and struggles in the athletes' private lives and/or careers (e.g. performance issues or termination from sport; Wolanin et al., 2015). Hence, it is crucial to gather empirical evidence on how to best support and treat this group of athletes.

Despite efforts to rely on theories or existing established models, a major concern for intervention research in sport is the lack of knowledge about mediators that explain how and why interventions affect outcomes. The use of mediating variables is central to interventions designed to affect behaviour (Mackinnon, 2011) and evidence-based interventions should not solely target the troubled behaviour but also the underlying mechanisms (i.e. mediators) that drive the troubled behaviour (Kazdin, 2007).

Dispositional mindfulness (i.e. awareness and attention to our thoughts and feelings in the present moment) and emotional regulation (i.e. lack of emotional awareness, clarity, acceptance, and distress tolerance) are the putative mechanisms of the MAC approach (Josefsson et al., 2019; Moore, 2009). These mediators were, however, not examined in the studies that implemented MAC interventions (Goodman et al., 2014; Gross et al., 2018; Macdougall et al., 2019). Another mechanism underlying third wave therapies is experiential avoidance (i.e. the avoidance of undesirable thoughts, memories, and emotions; Hayes et al., 2006), which has been shown to mediate the relation between various symptom types and psychological constructs (Ruiz, 2010). However, in several studies, experiential avoidance (measured alongside psychological inflexibility; Bond et al., 2011) was assessed as an outcome variable rather than as a mediator. Consequently, current evidence provides limited insight into mechanisms that account for potential change in intervention outcomes.

Future directions

Several opportunities are available for addressing the knowledge gaps identified by this review of research into interventions for athletes' mental health. First, researchers should aim to clarify the goals of their interventions and the contexts to which these are best suited (i.e. mental health promotion, prevention, or treatment), while also considering the athletes' issues and the severity levels of those issues. Moreover, intervention studies including athlete samples with both subclinical and clinical mental health problems and disorders are warranted. If intervention studies are to target subclinical or clinical mental health outcomes, they should also include subclinical or clinical samples.

Second, future mental health intervention studies should include mediators in their design to better discern the processes linking intervention components to targeted

outcomes. Including mediators in intervention studies, however, requires a theoretical foundation of a putative mechanism to guide the intervention (Kazdin, 2007). One way to incorporate theoretical foundations more systematically is to employ methodological frameworks such as the Multiphase Optimisation Strategy (MOST; for a comprehensive overview of MOST, see Collins, 2018). MOST is a framework for developing, optimising, and evaluating behavioural interventions with the goal to 'empirically identify which intervention components work and which do not work, which ones work well together, and under which contextual characteristics' (Marques & Guastaferrro, 2022, p. 794). The abovementioned questions are highly relevant in relation to interventions and certainly in mental health interventions for athletes, but are currently unanswered. A better understanding of mediators will help researchers (and practitioners) design more effective interventions, thereby also enhancing intervention success.

Finally, a call for high-quality intervention studies is not new, but specific suggestions for raising the quality of intervention research in sport psychology are rare. One suggestion has been the use of frameworks such as MOST (Collins, 2018). Another suggestion is to implement high-quality single-case experimental designs (SCED; Tate et al., 2013). SCEDs have previously been put forward as a promising approach for mental health intervention research in athletes (Ekelund et al., 2022). For psychological interventions targeting mental health specifically, a single-case multiple-baselines design (MBD) across participants offers many attractive and useful features (Kazdin, 2021). Single-case MBD across participants can achieve high internal validity and experimental control, and can incorporate randomisation to further reduce threats to internal validity (Kratochwill & Levin, 2014).

Typically, in an MBD across participants, randomisation is achieved by randomly assigning the order in which individuals receive the intervention. In a study with three individuals, for example, each participant would be randomly assigned to one of three staggered starting points. In other words, they would be randomly assigned to start the intervention first, second, or third (Kazdin, 2021). The intervention effect is thereby demonstrated by introducing the independent variable (i.e. the intervention) to different (multiple) baselines at different points in time (Kratochwill & Levin, 2014).

Furthermore, mediators could be incorporated into the design, allowing for close and continuous inspection of changes and fluctuations in the outcome variables of interest and creating an understanding of the process of change throughout the intervention. Hence, interventions using single-case experimental designs could be used to unlock the black box and provide a detailed outline of the link between intervention components, mechanisms of change, and the outcome variables.

Limitations

The current scoping review is not without limitations. First, the search was restricted to English language peer-reviewed papers and grey literature was excluded. Although restricting the language may have introduced bias in the sample of studies, the magnitude of the bias is unknown, and evidence suggests that language restriction may have little influence on the results (Dobrescu et al., 2021). Second, this review obtained a large number of articles in the electronic searches. The onerous task of screening over 26,000 articles was supported by a new machine-learning tool, ASReview. Although ASReview reduced the number of

articles that needed to be screened, the system's error rates are impossible to evaluate without labelling the full dataset. Hence, the extent of the unintentional exclusion of articles is unknown. Nevertheless, ASReview, is an open-access, transparent, easily accessible time-saving tool that supports current and future reviews. The alternative, screening all articles by hand, would be immensely time-consuming and present a tangible risk of human errors.

Third, this review is also limited by the scattered results. Though only 44 studies were included, the challenging synthesis of their results reflects the current status of mental health interventions in the field. For this reason, this review cannot provide evidence-based recommendations for practice. Fourth, we aimed to answer the question of what mediators have been studied and, thus, identify mechanisms of change. However, this was not possible due to the almost complete absence of studies that included mediators. Consequently, we cannot make recommendations about effective mechanisms for inclusion in future interventions. Instead, we can only encourage future investigation of putative mediators and prompt researchers to address the critical knowledge gaps we have identified.

Conclusion

This review shines light on intervention research that has emerged mainly in the past 15 years and identifies several important issues for future consideration. The synthesis of findings suggest that the current literature on mental health interventions for athletes is inconclusive. Consequently, few evidence-based recommendations can be made and, to date, the effective components of mental health interventions for athletes are unknown. Although some promising themes have emerged (e.g. the use of established theories or models such as cognitive behavioural therapy), there is room for improvement, particularly regarding study quality; the operationalisation of mental health; and the proper use of promotion, prevention, or treatment of the target population's mental health. In conclusion, there is a pressing need for high-quality intervention studies, especially those that evaluate mediators in subclinical or clinical samples. As a result, the field of sport psychology will be more equipped to intervene for athletes' mental health when and where necessary.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The final score of critical appraisals can be found in the supplementary materials. Further information regarding data from ASReview is openly available at <https://osf.io/cbtgm/>.

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References

- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.).
- APA Presidential Task Force on Evidence-Based Practice. (2006). Evidence-based practice in psychology. *American Psychologist*, 61(4), 271–285. <https://doi.org/10.1037/0003-066X.61.4.271>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32. <https://doi.org/10.1080/1364557032000119616>
- Arnold, R., & Fletcher, D. (2012). A research synthesis and taxonomic classification of the organizational stressors encountered by sport performers. *Journal of Sport and Exercise Psychology*, 34(3), 397–429. <https://doi.org/10.1123/jsep.34.3.397>
- Azrin, N. H., McMahon, P., Donohue, B., Besalel, V., Lapinski, K., Kogan, E., Acierno, R. E., & Galloway, E. (1994). Behavior therapy of drug abuse: A controlled outcome study. *Behaviour Research and Therapy*, 32(8), 857–866. [https://doi.org/10.1016/0005-7967\(94\)90166-X](https://doi.org/10.1016/0005-7967(94)90166-X)
- Becker, C. B., McDaniel, L., Bull, S., Powell, M., & McIntyre, K. (2012). Can we reduce eating disorder risk factors in female college athletes? A randomized exploratory investigation of two peer-led interventions. *Body Image*, 9(1), 31–42. <https://doi.org/10.1016/j.bodyim.2011.09.005>
- Belz, J., Kleinert, J., & Anderten, M. (2020). One shot—no hit? Evaluation of a stress-prevention workshop for adolescent soccer players in a randomized controlled trial. *The Sport Psychologist*, 34(2), 132–142. <https://doi.org/10.1123/tsp.2019-0106>
- Bernstein, D. A., & Borkovec, T. D. (1973). *Progressive relaxation training: A manual for the Helping Professions*. Research Press.
- Bertollo, M., Forzini, F., Biondi, S., Di Liborio, M., Vaccaro, M. G., Georgiadis, E., & Conti, C. (2021). How does a sport psychological intervention help professional cyclists to cope with their mental health during the COVID-19 lockdown? *Frontiers in Psychology*, 12, Article 607152. <https://doi.org/10.3389/fpsyg.2021.607152>
- Birrer, D., Röthlin, P., & Morgan, G. (2021). Helping athletes flourish using mindfulness and acceptance approaches: An introduction and mini review. *Sport & Exercise Medicine Switzerland*, 69(2), 29–34. <https://doi.org/10.24451/arbor.16849>
- Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and action questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, 42(4), 676–688. <https://doi.org/10.1016/j.beth.2011.03.007>
- Breslin, G., Shannon, S., Cummings, M., & Leavey, G. (2022). An updated systematic review of interventions to increase awareness of mental health and well-being in athletes, coaches, officials and parents. *Systematic Reviews*, 11(1), 1–29. <https://doi.org/10.1186/s13643-022-01932-5>
- Bricker, J. B., & Tollison, S. J. (2011). Comparison of motivational interviewing with acceptance and commitment therapy: A conceptual and clinical review. *Behavioural and Cognitive Psychotherapy*, 39(5), 541–559. <https://doi.org/10.1017/S1352465810000901>
- Çakmakçı, E., Mozafarizadeh, M., & Tayebi, S. M. (2020). Cognitive behavior therapy improved the symptoms of bulimia nervosa in the athletes. *Annals of Applied Sport Science*, 8(1), <https://doi.org/10.29252/aassjournal.816>
- Carraça, B., Serpa, S., Rosado, A., & Guerrero, J. P. (2019a). A pilot study of a mindfulness-based program (MBSoccerP): The potential role of mindfulness, self-compassion and psychological flexibility on flow and elite performance in soccer athletes. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 14(1), 34–40.
- Carraça, B., Serpa, S., Rosado, A., Joan, P., & Magalhaes, C. (2019b). Mindful compassion training on elite soccer: Effects, roles and associations on flow, psychological distress and thought suppression. *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, 14(2), 141–149.
- Chandler, G. E., Kalmakis, K. A., Chiodo, L., & Helling, J. (2020). The efficacy of a resilience intervention among diverse, at-risk, college athletes: A mixed-methods study. *Journal of the American Psychiatric Nurses Association*, 26(3), 269–281. <https://doi.org/10.1177/1078390319886923>

- Chen, J. H., Tsai, P. H., Lin, Y. C., Chen, C. K., & Chen, C. Y. (2019). Mindfulness training enhances flow state and mental health among baseball players in Taiwan. *Psychology Research and Behavior Management, 12*, 15–21. <https://doi.org/10.2147/PRBM.S188734>
- Chen, S. P., Chang, W. P., & Stuart, H. (2020). Self-reflection and screening mental health on Canadian campuses: Validation of the mental health continuum model. *BMC Psychology, 8*(1), 1–8. <https://doi.org/10.1186/s40359-019-0349-1>
- Chervencova, L., Gencheva, N., & Lyudmilova, I. (2015). The effect of short-term multidisciplinary intervention on the levels of anxiety, ego-resilience and affect in sports shooters with disabilities. *Sports Medicine Journal, 11*(4), 2662–2667.
- Coelho, R. W., Keller, B., Kuczynski, K. M., Ribeiro Jr, E., Lima, M. C. d. A. M., Greboggy, D., & Stefanello, J. M. F. (2012). Use of multimodal imagery with precompetitive anxiety and stress of elite tennis players. *Perceptual and Motor Skills, 114*(2), 419–428. <https://doi.org/10.2466/02.05.15.PMS.114.2.419-428>
- Collins, L. M. (2018). *Optimization of behavioral, biobehavioral, and biomedical interventions: The multiphase optimization strategy (MOST)*. Springer.
- Dallmann, P., Bach, C., Zipser, H., Thomann, P. A., & Herpertz, S. C. (2016). Evaluation of a stress prevention program for young high-performance athletes. *Mental Health & Prevention, 4*(2), 75–80. <http://dx.doi.org/10.1016/j.mhp.2016.04.001>
- Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum.
- Diener, E., & Lucas, R. E. (1999). Personality and subjective well-being. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 213–229). Russell Sage Foundation.
- Diener, E., Lucas, R. E., & Oishi, S. (2002). Subjective well-being: The science of happiness and life satisfaction. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 63–73). Oxford University Press.
- Dimidjian, S., Arch, J. J., Schneider, R. L., Desormeau, P., Felder, J. N., & Segal, Z. V. (2016). Considering meta-analysis, meaning, and metaphor: A systematic review and critical examination of “third wave” cognitive and behavioral therapies. *Behavior Therapy, 47*(6), 886–905. <https://doi.org/10.1016/j.beth.2016.07.002>
- Dobrescu, A. I., Nussbaumer-Streit, B., Klerings, I., Wagner, G., Persad, E., Sommer, I., Herkner, H., & Gartlehner, G. (2021). Restricting evidence syntheses of interventions to English-language publications is a viable methodological shortcut for most medical topics: A systematic review. *Journal of Clinical Epidemiology, 137*, 209–217. <https://doi.org/10.1016/j.jclinepi.2021.04.012>
- Donohue, B., Gavrilova, Y., Galante, M., Gavrilova, E., Loughran, T., Scott, J., Chow, G., Plant, C. P., & Allen, D. N. (2018). Controlled evaluation of an optimization approach to mental health and sport performance. *Journal of Clinical Sport Psychology, 12*(2), 234–267. <https://doi.org/10.1123/jcsp.2017-0054>
- Dowell, T. L., Waters, A. M., Usher, W., Farrell, L. J., Donovan, C. L., Modecki, K. L., Zimmer-Gembeck, M. J., Castle, M., & Hinchey, J. (2021). Tackling mental health in youth sporting programs: A pilot study of a holistic program. *Child Psychiatry & Human Development, 52*(1), 15–29. <https://doi.org/10.1007/s10578-020-00984-9>
- Dubuc-Charbonneau, N., & Durand-Bush, N. (2015). Moving to action: The effects of a self-regulation intervention on the stress, burnout, well-being, and self-regulation capacity levels of university student-athletes. *Journal of Clinical Sport Psychology, 9*(2), 173–192. <https://doi.org/10.1123/jcsp.2014-0036>
- Ekelund, R., Holmström, S., & Stenling, A. (2022). Mental health in athletes: Where are the treatment studies? *Frontiers in Psychology, 13*, Article 781177. <https://doi.org/10.3389/fpsyg.2022.781177>
- Evers, A. G., Somogie, J. A., Wong, I. L., Allen, J. D., & Cuevas, A. G. (2021). The adaptation and evaluation of a pilot mindfulness intervention promoting mental health in student athletes. *Journal of Clinical Sport Psychology, 15*(3), 206–226. <https://doi.org/10.1123/jcsp.2019-0083>
- Festinger, L. (1957). *A theory of cognitive-dissonance*. In Stice, E., Trost, A., & Chase, (2003). Healthy weight control and dissonance-based eating disorder prevention programs: Results from a controlled trial. *International Journal of Eating Disorders, 33*(1), 10–21. <https://doi.org/10.1002/eat.10109>

- Fogaca, J. L. (2021). Combining mental health and performance interventions: Coping and social support for student-athletes. *Journal of Applied Sport Psychology*, 33(1), 4–19. <https://doi.org/10.1080/10413200.2019.1648326>
- Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 359(1449), 1367–1377. <https://doi.org/10.1098/rstb.2004.1512>
- Fujita, F., & Diener, E. (2005). Life satisfaction set point: Stability and change. *Journal of Personality and Social Psychology*, 88(1), 158–164. <https://doi.org/10.1037/0022-3514.88.1.158>
- Gabana, N. T., Steinfeldt, J., Wong, Y. J., Chung, Y. B., & Svetina, D. (2019). Attitude of gratitude: Exploring the implementation of a gratitude intervention with college athletes. *Journal of Applied Sport Psychology*, 31(3), 273–284. <https://doi.org/10.1080/10413200.2018.1498956>
- Gabana, N. T., Wong, Y. J., D'Addario, A., & Chow, G. M. (2022). The athlete gratitude group (TAGG): Effects of coach participation in a positive psychology intervention with youth athletes. *Journal of Applied Sport Psychology*, 34(2), 229–250. <https://doi.org/10.1080/10413200.2020.1809551>
- Gangyan, S. (2014). *Athlete mindfulness training manual*. Education University of Hong Kong.
- Gardner, F. L., & Moore, Z. E. (2007). *The psychology of human performance: The mindfulness acceptance-commitment approach*. Springer.
- Gardner, F. L., & Moore, Z. E. (2012). Mindfulness and acceptance models in sport psychology: A decade of basic and applied scientific advancements. *Canadian Psychology / Psychologie canadienne*, 53(4), 309–318. <https://doi.org/10.1037/a0030220>
- Glass, C. R., Spears, C. A., Perskaudas, R., & Kaufman, K. A. (2019). Mindful sport performance enhancement: Randomized controlled trial of a mental training program with collegiate athletes. *Journal of Clinical Sport Psychology*, 13(4), 609–628. <https://doi.org/10.1123/jcsp.2017-0044>
- Gollwitzer, P. (1993). Goal achievement: The role of intentions. *European Review of Social Psychology*, 4(1), 141–185. <https://doi.org/10.1080/14792779343000059>
- Goodman, F. R., Kashdan, T. B., Mallard, T. T., & Schumann, M. (2014). A brief mindfulness and yoga intervention with an entire NCAA Division I athletic team: An initial investigation. *Psychology of Consciousness: Theory, Research, and Practice*, 1(4), 339–356. <https://doi.org/10.1037/cns0000022>
- Gouttebauge, V., Castaldelli-Maia, J. M., Gorczyński, P., Hainline, B., Hitchcock, M. E., Kerkhoffs, G. M., Rice, S. M., & Reardon, C. L. (2019). Occurrence of mental health symptoms and disorders in current and former elite athletes: A systematic review and meta-analysis. *British Journal of Sports Medicine*, 53(11), 700–706. <https://doi.org/10.1136/bjsports-2019-100671>
- Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, 26(2), 91–108. <https://doi.org/10.1111/j.1471-1842.2009.00848.x>
- Gross, M., Moore, Z. E., Gardner, F. L., Wolanin, A. T., Pess, R., & Marks, D. R. (2018). An empirical examination comparing the mindfulness-acceptance-commitment approach and psychological skills training for the mental health and sport performance of female student athletes. *International Journal of Sport and Exercise Psychology*, 16(4), 431–451. <https://doi.org/10.1080/1612197X.2016.1250802>
- Haney, C. J. (2004). Stress-management interventions for female athletes: Relaxation and cognitive restructuring. *International Journal of Sport Psychology*, 35(2), 109–118.
- Harter, S. (1978). Effectance motivation reconsidered: Toward a developmental model. *Human Development*, 21(1), 34–64. <https://doi.org/10.1159/000271574>
- Harter, S. (1981). The development of competence motivation in the mastery of cognitive and physical skills: Is there still a place for joy? In C. H. Nadeau (Ed.), *Psychology of motor behavior and sport* (pp. 3–29). Human Kinetics.
- Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, 35(4), 639–665. [https://doi.org/10.1016/S0005-7894\(04\)80013-3](https://doi.org/10.1016/S0005-7894(04)80013-3)
- Hayes, S. C., & Hofmann, S. G. (2017). The third wave of cognitive behavioral therapy and the rise of process-based care. *World Psychiatry*, 16(3), 245–246. <https://doi.org/10.1002/wps.20442>
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1–25. <https://doi.org/10.1016/j.brat.2005.06.006>

- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy*. Guilford Press.
- Herzog, T., Eiring, K. M., & Bartley, J. D. (2022). General approaches to management of mental health in elite athletes: Psychotherapy. In C. L. Reardon (Ed.), *Mental health care for elite athletes* (pp. 7–13). Springer International Publishing.
- Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O’Cathain, A., Rousseau, M.-C., Vedel, I., & Pluye, P. (2018). The mixed methods appraisal tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285–291. <https://doi.org/10.3233/EFI-180221>
- Howard, B. E., Phillips, J., Tandon, A., Maharana, A., Elmore, R., Mav, D., Sedykh, A., Thayer, K., Merrick, A., Walker, V., Rooney, A., & Shah, R. R. (2020). SWIFT-active screener: Accelerated document screening through active learning and integrated recall estimation. *Environment International*, 138, Article 105623. <https://doi.org/10.1016/j.envint.2020.105623>
- Jones, B. J., Kaur, S., Miller, M., & Spencer, R. M. (2020). Mindfulness-based stress reduction benefits psychological well-being, sleep quality, and athletic performance in female collegiate rowers. *Frontiers in Psychology*, 11, Article 572980. <https://doi.org/10.3389/fpsyg.2020.572980>
- Josefsson, T., Ivarsson, A., Gustafsson, H., Stenling, A., Lindwall, M., Tornberg, R., & Böröy, J. (2019). Effects of mindfulness-acceptance-commitment (MAC) on sport-specific dispositional mindfulness, emotion regulation, and self-rated athletic performance in a multiple-sport population: an RCT Study. *Mindfulness*, 10(8), 1518–1529. <https://doi.org/10.1007/s12671-019-01098-7>
- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: theoretical considerations and preliminary results. *General Hospital Psychiatry*, 4(1), 33–47. [https://doi.org/10.1016/0163-8343\(82\)90026-3](https://doi.org/10.1016/0163-8343(82)90026-3)
- Kabat-Zinn, J. (1994). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delacorte.
- Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10(2), 144–156. <https://doi.org/10.1093/clipsy.bpg016>
- Kaufman, K. A., Glass, C. R., & Arnkoff, D. B. (2009). Evaluation of mindful sport performance enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sport Psychology*, 3(4), 334–356. <https://doi.org/10.1123/jcsp.3.4.334>
- Kaufman, K. A., Glass, C. R., & Pineau, T. R. (2016). Mindful sport performance enhancement (MSPE): Development and applications. In A. Baltzell (Ed.), *Mindfulness and performance* (pp. 153–185). Cambridge University Press.
- Kaufman, K. A., Glass, C. R., & Pineau, T. R. (2018). *Mindful sport performance enhancement: Mental training for athletes and coaches*. American Psychological Association.
- Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, 3(1), 1–27. <https://doi.org/10.1146/annurev.clinpsy.3.022806.091432>
- Kazdin, A. E. (2021). *Single-case research designs: Methods for clinical and applied settings* (3rd ed). Oxford University Press.
- Kegelaers, J., Wylleman, P., Defruyt, S., Praet, L., Stambulova, N., Torregrossa, M., Kenttä, G., & De Brandt, K. (2022). The mental health of student-athletes: A systematic scoping review. *International Review of Sport and Exercise Psychology*, <https://doi.org/10.1080/1750984X.2022.2095657>
- Keyes, C. L. M. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology*, 73(3), 539–548. <https://doi.org/10.1037/0022-006X.73.3.539>
- Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A 12 complementary strategy for improving national mental health. *American Psychologist*, 62(2), 95–108. <https://doi.org/10.1037/0003-066X.62.2.95>
- Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior*, 43(2), 207–222. <https://doi.org/10.2307/3090197>
- Keyes, C. L. M. (2012). Toward a science of mental health. In C. R. Snyder & S. J. Lopez (Eds.), *The Oxford Handbook of Positive Psychology* (2nd ed., pp. 89–96). Oxford University Press.

- Kolb, A. Y., & Kolb, D. A. (2005). Learning style and learning spaces: Enhancing experiential learning in higher education. *Academy of Management Learning & Education*, 4(2), 1–20.
- Kouali, D., Hall, C., & Deck, S. (2020). Examining the effectiveness of an imagery intervention in enhancing athletes' eudaimonic well-being. *Journal of Imagery Research in Sport and Physical Activity*, 15(1), Article 20200003. <https://doi.org/10.1515/jirspa-2020-0003>
- Kratochwill, T. R., & Levin, J. R. (2014). *Single-case intervention research: Methodological and statistical advances*. American Psychological Association.
- Küttel, A., & Larsen, C. H. (2020). Risk and protective factors for mental health in elite athletes: A scoping review. *International Review of Sport and Exercise Psychology*, 13(1), 231–265. <https://doi.org/10.1080/1750984X.2019.1689574>
- Laslett, B., & Uphill, M. (2020). An online intervention to support student-athlete mental health: Implementation, evaluation, and critical reflection. *Case Studies in Sport and Exercise Psychology*, 4(S1), S1–54–S1–61. <https://doi.org/10.1123/cssep.2019-0048>
- Laureano, C., Nienaber, A. W., & Grobbelaar, H. W. (2014). Facilitating the coping self-efficacy and psychological well-being of student rugby players. *South African Journal of Psychology*, 44(4), 483–497. <https://doi.org/10.1177/0081246314541635>
- Laurin, R., Nicolas, M., & Lavallee, D. (2008). Personal goal management intervention and mood states in soccer academies. *Journal of Clinical Sport Psychology*, 2(1), 57–70. <https://doi.org/10.1123/jcsp.2.1.57>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Lebrun, F., & Collins, D. (2017). Is elite sport (really) bad for you? Can we answer the question? *Frontiers in Psychology*, 8, Article 324. <https://doi.org/10.3389/fpsyg.2017.00324>
- Lent, R. W. (2004). Toward a unifying theoretical and practical perspective on well-being and psychosocial adjustment. *Journal of Counseling Psychology*, 51(4), 482–509. <https://doi.org/10.1037/0022-0167.51.4.482>
- Long, B. C. (1984). Aerobic conditioning and stress inoculation: A comparison of stress management interventions. *Cognitive Therapy and Research*, 8(5), 517–541. <https://doi.org/10.1007/BF01173289>
- Luetmer, M. T., Do, A., Canzanello, N. C., Bauer, B. A., & Laskowski, E. R. (2019). The feasibility and effects of acupuncture on muscle soreness and sense of well-being in an adolescent football population. *American Journal of Physical Medicine & Rehabilitation*, 98(11), 964–970. <https://doi.org/10.1097/PHM.0000000000001226>
- Lundqvist, C. (2011). Well-being in competitive sports—The feel-good factor? A review of conceptual considerations of well-being. *International Review of Sport and Exercise Psychology*, 4(2), 109–127. <https://doi.org/10.1080/1750984X.2011.584067>
- Lundqvist, C. (2020). Ending an elite sports career: Case report of behavioral activation applied as an evidence-based intervention with a former Olympic athlete developing depression. *The Sport Psychologist*, 34(4), 329–336. <https://doi.org/10.1123/tsp.2019-0152>
- Lundqvist, C., & Andersson, G. (2021). Let's talk about mental health and mental disorders in elite sports: A narrative review of theoretical perspectives. *Frontiers in Psychology*, 12, Article 2515. <https://doi.org/10.3389/fpsyg.2021.700829>
- Lundqvist, C., Jederström, M., Korhonen, L., & Timpka, T. (2022). Nuances in key constructs need attention in research on mental health and psychiatric disorders in sports medicine. *BMJ Open Sport & Exercise Medicine*, 8(3), Article e001414. <https://doi.org/10.1136/bmjsem-2022-001414>
- Lundqvist, C., & Sandin, F. (2014). Well-Being in elite sport: Dimensions of hedonic and eudaimonic well-being among elite orienteers. *The Sport Psychologist*, 28(3), 245–254. <https://doi.org/10.1123/tsp.2013-0024>
- Maccougall, H., O'Halloran, P., Sherry, E., & Shields, N. (2016). Needs and strengths of Australian para athletes: Identifying their subjective psychological, social, and physical health and well-being. *The Sport Psychologist*, 30(1), 1–12. <https://doi.org/10.1123/tsp.2015-0006>
- Maccougall, H., O'Halloran, P., Sherry, E., & Shields, N. (2019). A pilot randomised controlled trial to enhance well-being and performance of athletes in para sports. *European Journal of Adapted Physical Activity*, 12(8). <https://doi.org/10.5507/euj.2019.006>
- Mackinnon, D. P. (2011). Integrating mediators and moderators in research design. *Research on Social Work Practice*, 21(6), 675–681. <https://doi.org/10.1177/1049731511414148>

- Marques, M. M., & Guastaferrero, K. (2022). The development of effective and tailored digital behavior change interventions: an introduction to the multiphase optimization strategy (MOST). *European Health Psychologist*, 22(4), 793–800.
- McCarthy, P. J., Jones, M. V., Harwood, C. G., & Davenport, L. (2010). Using goal setting to enhance positive affect among junior multi-event athletes. *Journal of Clinical Sport Psychology*, 4(1), 53–68. <https://doi.org/10.1123/jcsp.4.1.53>
- Meichenbaum, D. (1985). *Stress inoculation training*. Pergamin.
- Minkler, M., & Wallerstein, N. (2008). *Community-based participatory research for health* (2nd ed., p. 544). Jossey-Bass.
- Moesch, K., Ivarsson, A., & Johnson, U. (2020). “Be mindful even though it hurts”: A single-case study testing the effects of a mindfulness-and acceptance-based intervention on injured athletes’ mental health. *Journal of Clinical Sport Psychology*, 14(4), 399–421. <https://doi.org/10.1123/jcsp.2019-0003>
- Mohammed, W. A., Pappous, A., & Sharma, D. (2018). Effect of mindfulness based stress reduction (MBSR) in increasing pain tolerance and improving the mental health of injured athletes. *Frontiers in Psychology*, 9, Article 722. <https://doi.org/10.3389/fpsyg.2018.00722>
- Moore, Z. E. (2009). Theoretical and empirical developments of the mindfulness-acceptance-commitment (MAC) approach to performance enhancement. *Journal of Clinical Sport Psychology*, 3(4), 291–302. <https://doi.org/10.1123/jcsp.3.4.291>
- Mosewich, A. D., Crocker, P. R., Kowalski, K. C., & DeLongis, A. (2013). Applying self-compassion in sport: An intervention with women athletes. *Journal of sport and exercise psychology*, 35(5), 514–524. <https://doi.org/10.1123/jsep.35.5.514>
- Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 1–7. <https://doi.org/10.1186/s12874-017-0458-6>
- Neff, K. D., & Germer, G. K. (2013). A pilot study and randomized control trial of the mindful self compassion program. *Journal of Clinical Psychology*, 69(1), 28–44. <https://doi.org/10.1002/jclp.21923>
- Newburg, D., Kimiecik, J., Durand-Bush, N., & Doell, K. (2002). The role of resonance in performance excellence and life engagement. *Journal of Applied Sport Psychology*, 14(4), 249–267. <https://doi.org/10.1080/10413200290103545>
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91(3), 328–346. <https://doi.org/10.1037/0033-295X.91.3.328>
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Harvard University Press.
- Ning, J. H., Hao, Q. W., & Huang, D. C. (2022). Effects of “mindfulness acceptance insight commitment” training on flow state and mental health of college swimmers: A randomized controlled experimental study. *Frontiers in Psychology*, 13, Article 799103. <https://doi.org/10.3389/fpsyg.2022.799103>
- Nuttin, J. R. (1985). *Théorie de la motivation humaine*. P.U.F.
- Ofoegbu, T. O., Asogwa, U. D., Ogbonna, C. S., Aloh, H. E., Eseadi, C., Eskay, M., Nji, G. C., Ngwoke, O. R., Agboti, C. I., Nnachi, R. A., Nnachi, O. C., & Otu, M. S. (2020). Effect of digital storytelling intervention on burnout thoughts of adolescent athletes with disabilities. *Medicine*, 99(30), Article e21164. <https://doi.org/10.1097/MD.00000000000021164>
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan – A web and mobile app for systematic reviews. *Systematic Reviews*, 5(1), Article 210. <https://doi.org/10.1186/s13643-016-0384-4>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonalds, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International Journal of Surgery*, 88, Article 105906. <https://doi.org/10.1016/j.ijso.2021.105906>
- Perna, F. M., Antoni, M. H., Kumar, M., Cruess, D. G., & Schneiderman, N. (1998). Cognitive-behavioral intervention effects on mood and cortisol during exercise training. *Annals of Behavioral Medicine*, 20(2), 92–98. <https://doi.org/10.1007/BF02884454>

- Podlog, L. W., Heil, J., Burns, R. D., Bergeson, S., Iriye, T., Fawver, B., & Williams, A. M. (2020). A cognitive behavioral intervention for college athletes with injuries. *The Sport Psychologist*, 34(2), 111–121. <https://doi.org/10.1123/tsp.2019-0112>
- Prior, E., Papatomas, A., & Rhind, D. (2022). A systematic scoping review of athlete mental health within competitive sport: Interventions, recommendations, and policy. *International Review of Sport and Exercise Psychology*, <https://doi.org/10.1080/1750984X.2022.2095659>
- Purcell, R., Gwyther, K., & Rice, S. M. (2019). Mental health in elite athletes: Increased awareness requires an early intervention framework to respond to athlete needs. *Sports Medicine*, 5, Article 46.
- Rice, S. M., Purcell, R., De Silva, S., Mawren, D., McGorry, P. D., & Parker, A. G. (2016). The mental health of elite athletes: A narrative systematic review. *Sports Medicine*, 46(9), 1333–1353. <https://doi.org/10.1007/s40279-016-0492-2>
- Ros, R., Bjarnason, E., & Runeson, P. (2017). A machine learning approach for semi-automated search and selection in literature studies. In *Proceedings of the 21st International Conference on Evaluation and Assessment in Software Engineering* (p. 118-127).
- Ruiz, F. J. (2010). A review of acceptance and commitment therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology and Psychological Therapy*, 10(1), 125–162.
- Ryan, R., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52(1), 141–166. <https://doi.org/10.1146/annurev.psych.52.1.141>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.
- Sabiston, C. M., Vani, M., de Jonge, M., & Nesbitt, A. (2022). Scoping reviews and rapid reviews. *International Review of Sport and Exercise Psychology*, 15(1), 91–119. <https://doi.org/10.1080/1750984X.2021.1964095>
- Sandgren, S. S., Haycraft, E., Arcelus, J., & Plateau, C. R. (2022). Evaluating a motivational and psycho-educational self-help intervention for athletes with mild eating disorder symptoms: A mixed methods feasibility study. *European Eating Disorders Review*, 30(3), 250–266. <https://doi.org/10.1002/erv.2891>
- Searle, B. A. (2008). *Well-being: In search of a good life?* Policy Press.
- Sekizaki, R., Nemoto, T., Tsujino, N., Takano, C., Yoshida, C., Yamaguchi, T., Katagiri, N., Ono, Y., & Mizuno, M. (2017). School mental healthcare services using internet-based cognitive behaviour therapy for young male athletes in Japan. *Early Intervention in Psychiatry*, 13(1), 79–85. <https://doi.org/10.1111/eip.12454>
- Seligman, M. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5–14. <https://doi.org/10.1037/0003-066X.55.1.5>
- Shannon, S., Hanna, D., Haughey, T., Leavey, G., McGeown, C., & Breslin, G. (2019). Effects of a mental health intervention in athletes: Applying self-determination theory. *Frontiers in Psychology*, 10, Article 1875. <https://doi.org/10.3389/fpsyg.2019.01875>
- Smith, A., & Petrie, T. (2008). Reducing the risk of disordered eating among female athletes: A test of alternative interventions. *Journal of Applied Sport Psychology*, 20(4), 392–407. <https://doi.org/10.1080/10413200802241832>
- Smith, R. E. (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sport & Exercise Psychology*, 8, 36–50.
- Society of Clinical Psychology (American Psychological Association Division 12). (n.d.). *Treatments*. <https://div12.org/treatments/>
- Stewart, T. M., Pollard, T., Hildebrandt, T., Wesley, N. Y., Kilpela, L. S., & Becker, C. B. (2019). The female athlete body project study: 18-month outcomes in eating disorder symptoms and risk factors. *International Journal of Eating Disorders*, 52(11), 1291–1300. <https://doi.org/10.1002/eat.23145>

- Stillman, M. A., Glick, I. D., McDuff, D., Reardon, C. L., Hitchcock, M. E., Fitch, V. M., & Hainline, B. (2019). Psychotherapy for mental health symptoms and disorders in elite athletes: A narrative review. *British Journal of Sports Medicine*, 53(12), 767–771. <https://doi.org/10.1136/bjsports-2019-100654>
- Stranberg, M., Slager, E., Spital, D., Coia, C., & Quatromoni, P. A. (2020). Athlete-specific treatment for eating disorders: Initial findings from the walden GOALS program. *Journal of the Academy of Nutrition and Dietetics*, 120(2), 183–192. <https://doi.org/10.1016/j.jand.2019.07.019>
- Ströhle, A. (2019). Sports psychiatry: Mental health and mental disorders in athletes and exercise treatment of mental disorders. *European Archives of Psychiatry and Clinical Neuroscience*, 269(5), 485–498. <https://doi.org/10.1007/s00406-018-0891-5>
- Sutcliffe, J. T., Graupensperger, S., Schweickle, M. J., Rice, S. M., Swann, C., & Vella, S. A. (2021). Mental health interventions in non-elite sport: A systematic review and meta-analysis. *International Review of Sport and Exercise Psychology*, <https://doi.org/10.1080/1750984X.2021.2001839>
- Tahtinen, R. E., Shelley, J., & Morris, R. (2021). Gaining perspectives: A scoping review of research assessing depressive symptoms in athletes. *Psychology of Sport and Exercise*, 54, Article 101905. <https://doi.org/10.1016/j.psychsport.2021.101905>
- Tate, R. L., Perdices, M., Rosenkoetter, U., Wakim, D., Godbee, K., Togher, L., & McDonald, S. (2013). Revision of a method quality rating scale for single-case experimental designs and n-of-1 trials: The 15-item risk of bias in N-of-1 trials (RoBiNT) scale. *Neuropsychological Rehabilitation*, 23(5), 619–638. <https://doi.org/10.1080/09602011.2013.824383>
- Tate, R. L., Rosenkoetter, U., Wakim, D., Sigmundsdottir, L., Doubleday, J., Togher, L., McDonalds, S., & Perdices, M. (2015). *The risk of bias in N-of-1 trials (RoBiNT) scale: An expanded manual for the critical appraisal of single-case reports*. Author.
- Tod, D., Booth, A., & Smith, B. (2022). Critical appraisal. *International Review of Sport and Exercise Psychology*, 15(1), 52–72. <https://doi.org/10.1080/1750984X.2021.1952471>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., ... Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, 169(7), 467–473. <https://doi.org/10.7326/M18-0850>
- Trickett, E. J. (1996). A future for community psychology: The contexts of diversity and the diversity of contexts. *American Journal of Community Psychology*, 24(2), 209–234. <https://doi.org/10.1007/BF02510399>
- Turner, M. J. (2016). Rational emotive behavior therapy (REBT), irrational and rational beliefs, and the mental health of athletes. *Frontiers in Psychology*, 7, Article 1423. <https://doi.org/10.3389/fpsyg.2016.01423>
- Turner, M. J., Wood, A. G., Baker, J. B., & Chadha, N. (2020). Rational selftalk: A rationale emotional behavior therapy (REBT) perspective. In A. T. Latijniak & A. Hatzgeorgiadis (Eds.), *Self-talk in sport* (pp. 105–120). Routledge.
- Uphill, M., Sly, D., & Swain, J. (2016). From mental health to mental wealth in athletes: Looking back and moving forward. *Frontiers in Psychology*, 7, 935. <https://doi.org/10.3389/fpsyg.2016.00935>
- van de Schoot, R., de Bruin, J., Schram, R., Zahedi, P., de Boer, J., Weijdemans, F., Kramer, B., Huijts, M., Hoogerwerf, M., Ferdinands, G., Harkema, A., Willemsen, J., Ma, Y., Fang, Q., Hindriks, S., Tummers, L., & Oberski, D. L. (2021). An open source machine learning framework for efficient and transparent systematic reviews. *Nature Machine Intelligence*, 3(2), 125–133. <https://doi.org/10.1038/s42256-020-00287-7>
- Vella, S. A., Schweickle, M. J., Sutcliffe, J. T., & Swann, C. (2021). A systematic review and meta-meta-synthesis of mental health position statements in sport: Scope, quality and future directions. *Psychology of Sport and Exercise*, 55, Article 101946. <https://doi.org/10.1016/j.psychsport.2021.101946>
- Vidic, Z., Martin, M. S., & Oxhandler, R. (2018). Mindfulness meditation intervention with male collegiate soccer players: Effect on stress and various aspects of life. *The Sport Journal*, 21.
- Wakefield, J. C., & First, M. B. (2013). Clarifying the boundary between normality and disorder: A fundamental conceptual challenge for psychiatry. *The Canadian Journal of Psychiatry*, 58(11), 603–605. <https://doi.org/10.1177/070674371305801104>

- Waters, A. M., Sluis, R. A., Usher, W., Farrell, L. J., Donovan, C. L., Modecki, K. L., Zimmer-Gembeck, M. J., Castle, M., & Hinchey, J. (2022). Kick-starting youth wellbeing and access to mental health care: Efficacy of an integrated model of care within a junior sports development program. *Behaviour Research and Therapy*, 157, Article 104166. <https://doi.org/10.1016/j.brat.2022.104166>
- Wolanin, A., Gross, M., & Hong, E. (2015). Depression in athletes: Prevalence and risk factors. *Current sports medicine reports*, 14(1), 56–60. <https://doi.org/10.1249/JSR.0000000000000123>
- Wong, R. S. K., How, P. N., & Cheong, J. P. G. (2022). The effectiveness of a mindfulness training program on selected psychological indices and sports performance of sub-elite squash athletes. *Frontiers in Psychology*, 13. Article 906729. <https://doi.org/10.3389/fpsyg.2022.906729>
- Wong, Y. J., McKean Blackwell, N., Goodrich Mitts, N., Gabana, N. T., & Li, Y. (2017). Giving thanks together: A preliminary evaluation of the gratitude group program. *Practice Innovations*, 2(4), 243–257. <https://doi.org/10.1037/pri0000058>
- World Health Organization. (2013). *Mental health action plan (2013–2020)*. WHO Document Production Services.
- World Health Organization. (2014). *Mental health: A state of well-being*. http://www.who.int/features/factfiles/mental_health/en/.
- World Health Organization. (2019). *ICD-11: International classification of diseases (11th revision)*. <https://icd.who.int/>.
- World Health Organization. (2022). *World mental health report: Transforming mental health for all*. World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.
- Zeldin, S., Christens, B. D., & Powers, J. L. (2013). The psychology and practice of youth-adult partnership: Bridging generations for youth development and community change. *American Journal of Community Psychology*, 51(3-4), 385–397. <https://doi.org/10.1007/s10464-012-9558-y>.

Appendix A

RCT	S1	S2	item2.1	item2.2	item2.3	item2.4	item2.5
Belz et al. (2020)	Yes	Yes	Can't tell	No	No	Can't tell	No
Haney (2004)	Yes	Yes	Yes	Yes	No	Can't tell	Can't tell
Donohue et al. (2018)	Yes	Yes	No	Yes	No	Yes	Can't tell
Glass et al. (2019)	Yes	Yes	No	Yes	No	No	Yes
Gross et al. (2018)	Yes	Yes	No	Yes	No	No	No
Macdougall et al. (2019)	Yes	Yes	Yes	Yes	Yes	No	Yes
Mosewich et al. (2013)	Yes	Yes	Yes	Can't tell	No	Yes	Can't tell
Ning et al. (2022)	Yes	Yes	No	Yes	Yes	Can't tell	Can't tell
Ofoegbu et al. (2020)	Yes	Yes	Yes	Yes	Yes	Can't tell	Can't tell
Stewart et al. (2019)	Yes	Yes	No	Yes	Yes	Can't tell	Yes

Quasi-experimental	S1	S2	item3.1	item3.2	item3.3	item3.4	item3.5
Bertollo et al. (2021)	Yes	Yes	Yes	Yes	Can't tell	No	No
Çakmakçı et al. (2020)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Carraça et al. (2019a)	Yes	Yes	Yes	Yes	No	No	Can't tell
Carraça et al. (2019b)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Chervencova et al. (2015)	Yes	Yes	Yes	Yes	Yes	No	No
Coelho et al. (2012)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Dallmann et al. (2016)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Dowell et al. (2022)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Evers et al. (2020)	Yes	Yes	Yes	Yes	No	No	Can't tell
Fogaca (2021)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes
Gabana et al. (2019)	Yes	Yes	Yes	Yes	Can't tell	Yes	No
Gabana et al. (2022)	Yes	Yes	Yes	Yes	Can't tell	No	Yes
Goodman et al. (2014)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Jones et al. (2020)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Laureano et al. (2014)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Laurin et al. (2008)	Yes	Yes	Yes	Yes	Yes	No	No
Mohammed et al. (2018)	No	Yes	Yes	Yes	No	No	Can't tell
Perna et al. (1998)	Yes	Yes	Yes	Yes	Yes	No	No
Podlog et al. (2020)	Yes	Yes	Yes	Yes	Yes	No	No
Sekizaki et al. (2019)	Yes	Yes	Yes	Yes	No	No	Can't tell
Shannon et al. (2019)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Smith and Petrie (2008)	Yes	Yes	Yes	Yes	No	No	No
Stranberg et al. (2019)	Yes	Yes	Yes	Yes	Yes	No	Can't tell
Waters et al. (2022)	Yes	Yes	Yes	Yes	No	No	Can't tell

Mixed methods (quasi)	S1	S2	item3.1	item3.2	item3.3	item3.4	item3.5
Dubuc-Charbonneau and Durand-Bush (2015)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Chandler et al. (2020)	Yes	Yes	Yes	Yes	Can't tell	No	Can't tell
Chen et al. (2019)	Yes	Yes	Yes	Yes	No	Can't tell	Can't tell
Sandgren et al. (2022)	Yes	Yes	Yes	Yes	No	No	Can't tell
Vidic et al. (2018)	Yes	Yes	Yes	Yes	No	Can't tell	Can't tell

Single-case	item1	item2	item3	item4	item5	item6	item7	item8	item9	item10	item11	item12	item13	item14	item15	total score	internal validity	external validity
Kouali et al. (2020)	0	0	1	0	0	0	0	0	1	2	1	2	2	0	0	9	1	8
Laslett and Uphill (2020)	0	0	1	0	0	0	0	0	0	2	2	2	1	0	0	8	1	7
McCarthy et al. (2010)	0	2	0	0	0	0	0	1	1	2	2	2	2	0	0	12	2	10
Moesch et al. (2020)	0	1	0	0	0	0	0	0	0	2	0	1	1	0	0	5	1	4
Wong et al. (2022)	0	0	2	0	0	0	0	0	1	2	2	2	2	0	0	11	2	9