Factors affecting the mental health of elite athletes

Risk and Protective Factors for Mental Health in Elite Athletes: A Scoping Review

A. Kuettela*, C. H. Larsena

aDepartment of Sports Science and Clinical Biomechanics, University of Southern Denmark, Denmark

Andreas Kuettel (*corresponding author) ORCID: 0000-0003-0235-3590
Assistant Professor, Ph.D.
Department of Sports Science and Clinical Biomechanics
University of Southern Denmark
Campusvej 55, DK-5230 Odense M, Denmark
Phone: +45-50-172897 https://www.linkedin.com/in/andreas-küttel-b7682356
E-mail: akuttel@health.sdu.dk or andreaskuettel@bluewin.ch

Carsten Hvid Larsen
Associate Professor, Ph.D. ORCID: 0000-0003-3309-9417
Department of Sports Science and Clinical Biomechanics
University of Southern Denmark
Campusvej 55, DK-5230 Odense M, Denmark
E-mail: chlarsen@health.sdu.dk https://www.linkedin.com/in/carstenhvidlarsen/
Abstract

The purpose of this scoping review was to provide an overview of studies concerning the mental health (MH) of elite athletes and to provide a methodological, conceptual, and applied overview of factors affecting elite athletes’ MH. A total of nine reviews and 43 empirical studies were evaluated and are reported in three sections: sample characteristics, research design, and factors affecting elite athletes’ MH. These factors were grouped into risk and protective factors and divided into a personal and sport-environmental domain. The studies used quantitative (84%), qualitative (11%), and mixed-method (5%) designs and examined a wide range of sports in different countries. Our review shows that researchers have predominantly examined the prevalence of athletes’ mental ill-health (e.g., depression) and the related factors compromising MH. Potential protective factors such as the feeling of autonomy, positive relations in sport and private life, and adequate recovery were highlighted in the qualitative studies. The discussion appraises the findings through a critical lens, focuses on the current state of the research area and the MH definition, limitations, suggested practical implications (e.g., to provide MH literacy to both athletes and coaches), and future research directions (e.g., examining environments that foster elite athletes’ MH).

Key words: elite athletes; mental health; scoping review; sport; well-being
Factors affecting the mental health of elite athletes

Introduction

Research on mental health (MH) in elite sport has grown rapidly in recent years (Rice et al., 2016). Several studies have demonstrated significant levels of mental ill-health among athlete populations and therefore present cause for concern (Foskett & Longstaff, 2018; Schaal et al., 2011). Competitive international sport has led to increased pressure on elite athletes and the high demands and extensive training loads present potential threats to athletes’ MH (Rice et al., 2016). The prevalence of diagnosable psychiatric disorders in athletes ranges from 4% to 68% (Elbe & Jensen, 2016) and the variation in reported prevalence is a subject of ongoing debate (Gorczyński, Coyle, & Gibson, 2017). Furthermore, the peak competitive years for elite athletes tend to overlap with the peak age for the risk of onset of mental disorders (Gulliver et al., 2012).

The elite sports context consists of a unique range of stressors (Arnold & Fletcher, 2012). These include competitive (e.g., performance expectation), organizational (e.g., travel), and personal (e.g., family issues) stressors, that potentially increase the risk of mental illness in athletes (Rice et al., 2016). Just as physical training must be balanced with adequate recovery, so too must psychological demands be balanced with strategies to support MH. Since MH is a core component of any culture of excellence (Schinke, Stambulova, Si, & Moore, 2017), many elite sports organizations have recently increased their focus on athletes’ MH and aim to provide solutions through their sports environments (Henriksen et al., 2019).

In order to conduct an overview of the current state of knowledge on athletes’ MH, we have identified nine review-type papers through a systematic search (see Figure 1) and appraised them in terms of aims, type of review, number and characteristics of studies included, as well as major contributions (see a brief summary in Table 1). Reviews can be characterized by their methods used (i.e., search, appraisal, synthesis, and analysis) and can, according to Grant and
Factors affecting the mental health of elite athletes

Booth (2014), be divided into 14 different types, each with its strengths and weaknesses. For example, systematic reviews aim for exhaustive comprehensive searching, apply a well-defined query, and are useful to answer clearly defined questions. In scoping reviews, similar searching methods are used for answering much broader questions (e.g., “what is known about this concept?”) but no formal quality assessment of the included studies is conducted. Meta-analyses use statistical techniques to provide a more precise effect of results obtained in different studies. Narrative reviews are aimed at identifying and summarizing what has been previously published for the purpose of reinterpretation or discussion. In contrast to systematic/scoping reviews and meta-analyses, the methods used in narrative reviews to select the articles may not be described explicitly and thus, reproducing narrative reviews is hardly possible.

The first reviews concerning MH in athletes (Bär & Markser, 2013; Glick et al., 2012; Reardon & Factor, 2010) originated from the field of sport psychiatry and discussed the diagnosis and treatment of athletes suffering from mental disorders. Rice and colleagues (2016) assessed the prevalence of mental illnesses in athletes and structured the studies according to different topics (e.g., anxiety, eating disorder, substance abuse), whereas Gorczynski, Coyle, and Gibson (2017) compared mild or more severe depression between high-performance and non-athletes in their meta-analysis. Breslin, Shannon, Haughey, Donnelly, and Leavey (2017) explored the effectiveness of MH awareness programs, while Moesch et al. (2018) discussed the accessibility and quality of services in related to athletes’ MH in different European countries. The recent position stands on MH from the International Society of Sport Psychology (ISSP; Schinke et al., 2017) and the European Federation of Sport Psychology (FEPSAC; Moesch et al., 2018) represent the increasing attention directed at MH in sport.
Looking at the nine review papers (Table 1) from a developmental perspective, it can be observed that the discourse of MH in elite athletes originated from a rather negative conceptualization of athletes’ MH, hence from a clinical and treatment perspective. The ISSP and FEPSAC position stands represent a discourse stemming from positive psychology that directs the attention towards a proactive MH approach. Although risk and protective factors were mentioned in some of the above-mentioned reviews, to date, no review has systematically focused on factors affecting the MH of elite athletes. Still, knowledge about protective and risk factors concerning athletes’ MH can be crucial for researchers and practitioners, and this is where the current scoping review will contribute to the existing knowledge.

- Please insert Table 1 around here -

**Conceptual Framework**

The World Health Organization (WHO, 2014) defines mental health as ‘a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community’ (p.2). Hence, current views on MH and well-being have shifted the focus from a negative conceptualization of MH as the absence of mental illness to definitions that encompass positive aspects and include the level of functioning of individuals (Tennant et al., 2007; Uphill, Sly, & Swain, 2016). In this review, we refer to Keyes’ (2002; 2007) two-continuum model in which MH is characterized as a complete state. Keyes (2002) suggested that mental illness and mental health are two distinct but related dimensions existing on two separate continua. The first continuum relates to the absence and presence of mental illness, whilst the second relates to the absence or presence of mental health. Accordingly, athletes could simultaneously have both positive mental health and experience mental illness (e.g., Michael Phelps, who, despite his
Factors affecting the mental health of elite athletes

diagnosed depression experienced flourishing in certain periods of his long successful career).
Alternatively, athletes could be free from mental illness but may be languishing. Thus, MH provides a conceptual space that encapsulates the broad spectrum of both distressing and flourishing experiences but recognizes that the strategies designed to reduce distressing symptoms may not necessarily be the same as those designed to enhance flourishing (Uphill et al., 2016).

Looking beyond this conceptualization, MH is contextualized and refers to the alignment between the individual and the context (Henriksen et al., 2019). An elite athlete may thrive in one sports environment or area of life and struggle in another, pointing to the importance of the person-environment fit (Larsen, Alfermann, Henriksen, & Christensen, 2013). Environments shape the motives of athletes, which contributes to self-reflection and the intrapersonal lived experience of MH (Henriksen et al., 2019). Therefore, an appropriate and cognizant sporting environment may support athletes’ well-being and could as such be understood as a protective factor underpinning MH (Lebrun, MacNamara, Rodgers, & Collins, 2018). On the other hand, a dysfunctional environment could be a risk factor that leads to the athlete having mental issues. However, understanding whether a factor works as a risk or a protective factor for athletes’ MH is key for practitioners to shape environments that can help to nourish athletes’ well-being.

Keeping in mind our shared identity as sports psychology researchers with a strong applied perspective in elite sport, the critical component of this review was mainly applied to psychological research literature. We chose to apply the propositions of the ISSP MH consensus statement (Henriksen et al., 2019) as a critical lens to spur on the further development of the MH discourse in elite sport. The purpose of this scoping review was threefold: (a) to provide an overview of research concerning the MH of elite athletes from 1998 to 2018, (b) to identify and
Factors affecting the mental health of elite athletes
categorize factors affecting elite athletes’ MH, and (c) to critically appraise the papers and detect research gaps and future challenges.

Methodology

Methodologically, this review is informed by the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA-ScR; Tricco et al., 2018, see Appendix 1) and the recommendations of Grant and Booth (2009) on how to present results of a scoping review in tabular, graphical, and narrative forms.

Search Strategy and Identifying Relevant Papers

The search strategy was initiated in May 2018 and initially included the use of the five electronic databases: SPORTDiscus, SCOPUS, PsychINFO, EMBASE, and PubMed. The rationale for using these databases relates to their prominent usage in other systematic reviews (Park, Lavallee, & Tod, 2013; Rice et al., 2016; Sheridan, Coffee, & Lavallee, 2014) using a similar protocol. Database searches included the following search terms (e.g., for SCOPUS):

((TITLE-ABS-KEY (sport*)) AND (TITLE-ABS-KEY (athlete*))) AND ((TITLE-ABS-KEY (mental AND illness OR mental AND disorder OR psych* AND problem OR depression OR anxiety OR stress)) OR (TITLE-ABS-KEY (mental AND health OR mental AND well-being OR mental AND wellbeing OR flourishing))). We decided to include the more overarching term “well-being” instead of adding the 13 sub-concepts (e.g., life satisfaction, personal growth, and social integration) of Keyes’ (2005) dimensions reflecting mental health and flourishing. Similar search strategies have been applied in other reviews concerning athletes’ MH (e.g., Breslin et al., 2017; Rice et al., 2016). Additional citations were subsequently gathered through reading the reference lists of the articles and reviews already obtained.
Inclusion criteria for the current investigation were as follows. Studies had to: (a) be related to athletes’ MH or mental illness; (b) have a population comprising high-performance, elite, or professional athletes (based on the definition of Swann, Moran, & Piggott, 2015), (c) be published between 1998 and 2018, and (d) be written in English. Exclusion criteria were (a) grey literature was not included, (b) participants not described as elite athletes (college athletes were excluded because their athletic level can vary from local to national level), (c) commentaries about athletes’ MH, and (d) full-text not available. We excluded publications that focused exclusively on burnout, general stress, or concussions/overtraining that were not specifically related to athletes’ MH. Not including grey literature provides a possible bias, however, unpublished studies rarely impact the results and conclusions of reviews (Hartling et al., 2017).

The authors met on several occasions between May and July 2018 to review the initial records identified (n = 3155). After excluding articles based on titles that were not relevant, potential articles were taken to the abstract screening (n = 186) for further examination in accordance with the above-described inclusion and exclusion criteria. The same procedure was applied in the step from abstract to full-text screening (n = 64). Figure 1 provides an overview of the study selection process. The selection and analysis of the studies were monitored throughout the review process. Protocols for inclusion/exclusion and details about the search of the databases can be obtained from the first author upon request.

- Please insert Figure 1 around here -

**Bibliographic Coding and Appraisal of the Included Papers**

As part of the analysis process, each of the 43 empirical studies was assigned a bibliography number (in alphabetical order, see Table 2) and a similar systematic review protocol as used by Park et al. (2012) and Stambulova and Wylleman (2018) was applied to this
Factors affecting the mental health of elite athletes

analysis. The bibliographical code (in square brackets) will be used to help readers distinguish between the included articles and other references. After coding, the articles were re-read and appraised for (a) major foci of the study; (b) participants (i.e., number, mean age or age range, gender ratio) and contexts (i.e., sports, level, country); (c) methodology (i.e., type of study, design, methods/instruments used); (d) correlates and associations related to elite athletes’ MH; and (e) main findings and major contribution to the literature. A formal paper-by-paper critical quality assessment was not undertaken. Such appraisals are not a necessary feature of scoping reviews (Grant & Booth, 2009; Tricco et al., 2018), and such practices can distract readers from the purpose of a scoping review. We did, however, analyze the papers in a way that allowed us to make critical observations about the research as a body of work, in keeping with the goals of a scoping review. The result of this work is presented in Table 2, which represents an analysis of the included articles and which was also used to summarize the protective and risk factors.

- Please insert Table 2 around here -

Data Analysis to Identify Protective and Risk Factors for Athletes’ Mental Health

Several steps were taken to identify and categorize the factors related to athletes’ MH. Firstly, we selected and classified the correlates (quantitative studies) and associations (qualitative studies) related to mental health (e.g., mental well-being, flourishing) and mental ill-health (e.g., depression, anxiety, eating disorder) from each of the studies. Many studies examined multiple correlates, and in these cases, the correlates were listed separately. Secondly, we examined the direction of association of the correlates and associations and classified them as either protective or risk factors for athletes’ MH. Thirdly, based on the previous literature (e.g., Rice et al., 2016; Sarkar & Fletcher, 2014) and our own understanding of MH factors, we grouped the correlates/associations into overarching factor themes. For example, poor
Factors affecting the mental health of elite athletes

performance, deselection, pressure from sponsors, and weight control were grouped into sport-specific stressors, whereas self-discipline, mature defense mechanism, self-encouragement, self-reflection, and setting meaningful goals were grouped into protective behavior. Fourthly, we divided the overarching protective and risk factor themes into a personal domain and a sport-environmental domain and situated the overarching factors accordingly (Table 4). Throughout the analysis process, the authors had regular meetings to discuss the process of identifying correlates and categorizing the protective and risk factors. Furthermore, the participants of the ISSP Think Tank on MH in the fall of 2018 (Henriksen et al., 2019) provided an expert evaluation of the factor themes. Finally, in order to provide a visual overview and to facilitate the understanding of the factors related to elite athletes’ MH, we created a conceptual map (Figure 2) displaying the protective and risk factor themes and the number of correlates/associations within the personal domain and the sport-environmental domain, respectively.

Results

Quantitative Mapping

Research designs and instruments. Table 3 represents the study design and sample characteristics across the 43 empirical studies. Researchers have used quantitative characteristics (36), qualitative characteristics (5) or a combination of both (2) to examine the MH of elite athletes. Four studies employed a longitudinal approach while cross-sectional methods were employed in the remaining 39 studies. Well over four-fifths of the studies (36) collected data via questionnaires and the rest (7) collected data via interviews. The questionnaires can be divided into 11 categories: (a) stress and recovery (30); (b) general health and mood state (25); (c) sleep, eating, alcohol and smoking behavior (23); (d) depressive symptoms (21); (e) help-seeking attitude and behavior (13); (f) career and need satisfaction (9); (g) anxiety (8); (h) well-being (6);
Factors affecting the mental health of elite athletes

(i) resilience and coping (6); (j) social relationships and environment (5); and (k) perfectionism (5). The most frequently applied instrument was the General Health Questionnaire (GHQ-12; Goldberg & Williams, 1988) used in 14 studies, the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) used in ten studies, the Distress Screener (4DSQ; Braam et al., 2009) used in nine studies, and the Recovery-Stress Questionnaire (RESTQ; Kellmann & Kallus, 2001) used in six studies.

- Please insert Table 3 around here -

**Sample characteristics.** The total number of participants was 11,475 of which 2,857 were female athletes and 7,539 were male athletes. Four studies (in total 1,079 athletes) did not specify gender. More than half of the studies (24) had mixed-gender samples, 12 studies had purely male samples, and three studies were conducted with female athletes only. Sample sizes ranged between eight and 2,067. Eight studies had fewer than 50 participants and six studies were conducted with a sample size of between 51 and 100. Eighteen studies had between 101 and 300 participants, and 11 studies examined population sizes greater than 300. According to our inclusion criteria, the studies contained in this review reflected elite-level athletes (23) and professional athletes (15), or a combination of both (5). Their athletic status was either active (34), retired (2), or a combination of active and retired athletes (7). The samples contained team-sport athletes (16), athletes participating in individual sports (5), or a combination of both (22). In three studies, the athletes were aged under 16, in 28 studies, the athletes were aged between 16 and 26 and in six studies, the athletes were 27 or older. Four studies included athletes with a wide age range, while two studies did not report the age of the participants. As outlined in Table 3, the majority of studies were conducted in Western countries (26 in Europe, seven in Australia/Oceania, two in North America, two in Asia, and seven studies had samples from
Factors affecting the mental health of elite athletes

different continents/contexts). The fact that 81% of the included studies have been published in
the last five years (2013-2018) emphasizes the increased interest in the issue of athletes’ MH.

Qualitative Mapping

Factors affecting elite athletes’ mental health. Across the studies, we identified 82
correlates related to elite athletes’ MH. These variables were grouped into 25 overarching themes
during the analysis (ten protective factor themes and 15 risk factor themes; see Table 4 and
Figure 2). Eighty-one percent of the studies (35) examined personal risk factors (e.g., injury,
ineffective coping, adverse life events), while 37% of the studies examined sport-environmental
risk factors (e.g., deselection, stigma around help-seeking). Thirteen studies examined personal
protective factors (e.g., acceptance, positive social relationships), while 25% of the studies
investigated sport-environmental protective factors (e.g., climate of trust, access to specific
support). Injury and overtraining concerning athletes’ MH were the most researched themes with
37% of the studies examining these issues in relation to depressive symptoms and mental ill-
being. The majority of studies (27) examined exclusively risk factors, four studies explored
protective factors only, while the remaining 12 studies investigated MH risk and protective
factors together.

Personal protective factors. Experiencing acceptance and expressing one’s real self in
therapeutic relationships [10]; appropriate behavior such as self-discipline, mature defense
mechanism, and self-encouragement [23, 36, 39]; self-reflection and setting meaningful and
personally significant goals [36]; the use of available resources, and acceptance of multiple roles
[35] were the factors related to protective behavior investigated in five studies. Sports confidence
and sports success [35, 37], self-esteem [34], situational control [39], and employment status
after retirement [20] were found to be protective factors related to the feeling of competence.
Factors affecting the mental health of elite athletes

*Positive social relationships and support* were investigated as general social support [10, 23] and access to support [9] along with being married [28]. General recovery [14, 39], sport as a way to de-stress [37], and willpower in recovery [10] were *recovery* factors promoting MH. Two studies [35, 40] highlighted athletes’ *feeling of autonomy* (e.g., making own plans for the future) as a protective MH factor. Finally, two studies emphasized *basic needs satisfaction* [34] and *sports career satisfaction* [13] as factors fostering elite athletes’ MH.

**Sport-environmental protective factors.** Six studies highlighted the positive effect on the athletes’ support staff of *mental health literacy*, including awareness [7, 23, 24, 37], access to specialist support [9], and a positive therapeutic relationship [10] on athletes’ MH well-being. Furthermore, a *trusting and mastery-orientated climate* [34] such as confidentiality and trust in coach [23, 35] and encouragement of others towards help-seeking [23] were found to be beneficial factors. *Successful retirement adjustment* (i.e., retirement status compared to active elite athletes [28, 40]), or amount of working hours/employment status were related to a better MH status in athletes. Two studies investigated *sports friendships* [35], and *social support from the sports context* [23] and found these factors to be positively related to athletes’ MH.

- Please insert Table 4 around here -

**Personal risk factors.** Factors related to *injury and overtraining* in relation to MH were investigated as (severe or multiple) injuries [1, 3, 4, 8, 18, 19, 22, 23, 25, 28, 30, 32, 37, 40], concussion [12], or surgery [22, 32] and reflected the largest theme in terms of the number of studies included in this review. *Risk behavior and ineffective coping* were investigated in ten studies including perfectionist concerns [27, 34, 37], negative coping strategies [36, 38, 39], anxiety [9, 37,], fear of failure [4], difficulties in expressing emotions [23], and inaccurate self-understanding [10]. *Adverse life events* (e.g., death of a family member, separation) in the past
Factors affecting the mental health of elite athletes

six months were investigated in nine studies [16, 17, 18, 19, 22, 32, 37, 40, 43] and were found to have a strong negative impact on athletes’ MH status. Several studies [1, 2, 13, 15, 26, 30, 41] found female athletes to be at a higher risk of depressive symptoms, most often in aesthetic or leanness sports and frequently in combination with the female athlete triad syndrome. Poor general health [31], such as chronical back pain [3], permanent disability [28, 37], or osteoarthritis [42] was found to be related to athletes’ mental ill-health. Maladaptive personality traits and identity such as extreme athletic identity or hypermasculinity [10, 28], perfectionism [27, 34, 37], and social phobia [27] were the factors found in five studies. Four studies [18, 19, 22, 43] found positive relationships between sports career dissatisfaction and depressive symptoms and need dissatisfaction [34] was found to be among the strongest threats to athletes’ mental well-being. Chronic life stress was shown to be an influential factor for burnout and/or depressive symptoms [2, 14, 15, 39]. Negative relationship spillover [29] and lack of social support [22, 40] were potential risk indicators for languishing. Low quality of sleep [5, 15] and poor eating habits [9] were further risk factors compromising athletes’ MH.

**Sport-environmental risk factors.** Many different sport-specific stressors were found to have a negative effect on athletes’ MH, such as sporting pressure or competitive anxiety [4, 9, 10, 27], fear of failure or injury [4, 9, 26, 37], player’s position (e.g., forward) [30, 40], deselection [6], weight control [23], low match experience [31], or upcoming major sports event [11]. Athletes participating in individual [2, 38], and aesthetic sports [41] where a certain (lean) body image [9] is necessary were shown to have a higher prevalence of depressive symptoms. Uncertainty about retirement [2] and retired status compared to active status [17] were risk factors for athletes’ MH. Low support from teammates [17] and a general lack of support from the sporting environment [40] were further sport-environmental risk factors. Finally, stigma
Factors affecting the mental health of elite athletes

towards help-seeking was investigated in two studies [4, 23] and it was found that stigma and
other dynamics collude to create barriers to accessing support, which can have a potential
negative impact on athletes’ MH.

Discussion

The current scoping review aimed to provide a systematic overview of factors affecting
elite athletes’ MH. Specifically, the review gives a summary of sample characteristics, research
designs employed, and risk and protective factors related to athletes’ MH of studies conducted in
the last 20 year up to May 2018. In total, 82 correlates/associations related to the athletes’ MH
were identified, grouped, and categorized into personal protective factors (e.g., protective
behavior, social support), personal risk factors (e.g., injury, adverse life events), sport-
environmental protective factors (e.g., climate of trust, MH literacy), and sport-environmental
risk factors (e.g., pressure, deselection). In general, the focus was predominantly on risk factors
for mental ill-health, while protective factors fostering athletes’ MH were assessed in a minority
of the studies. Researchers have used mostly quantitative and, to a lesser extent, qualitative
methods across both genders and various types of sports. The results demonstrate that the study
area has grown rapidly over the past five years. In the following sections, some of the
propositions of the MH consensus statement (Henriksen et al., 2019) will be used as a critical
lens to discuss and appraise the findings of the current review.

- Please insert Figure 2 around here -

Mental Health in the Elite Sport Context Should be Better Defined

The current review showed that athletes’ MH has until now mainly been investigated
through symptoms of general psychological distress or the prevalence of symptoms of a common
mental disorder (CMD; e.g., depression, anxiety, and eating disorder). As such, MH was
Factors affecting the mental health of elite athletes

indirectly conceptualized as the absence of such symptoms. Assuming that all athletes who do not show or report clinical disorders are mentally healthy is too simplistic (Henriksen et al., 2019, Schinke et al., 2017) and does not align with the MH conceptualization of Keyes (2002) in which MH is understood as a dynamic and complete state where athletes may experience low levels of mental well-being at one end of the continuum and mental wealth, or flourishing, at the other end. The WHO (2014) definition of mental health adopts a positive psychology perspective and represents a more holistic view of MH, emphasizing well-being as a core construct. Only a few studies [e.g., 29, 34, 35] applied a sound theoretical model and/or framework to investigate athletes’ MH. Studies that investigated both sides of the MH continuum (i.e., languishing and flourishing; Keyes, 2002) were rare and mostly qualitative [e.g., 9, 10, 23, 28, 34, 39]. However, as Lundqvist (2011) argued, sport psychology studies have either failed to define well-being or used a variety of labels to describe the construct. Therefore, Lundqvist proposed a more integrated model of well-being that includes all three underlying dimensions (i.e., subjective, psychological, and mental) of well-being. Henriksen et al. (2019) advised researchers to develop a clear definition of mental health in sport. Consequently, based on the MH definitions of Keyes (2002, 2007) and the WHO (2014), the outcomes of the current review, and our experience working with athletes in various high-performance contexts, we propose the following definition of MH in relation to elite sport as:

Mental health is a dynamic state of well-being in which athletes can realize their potential, see a purpose and meaning in sport and life, experience trusting personal relationships, cope with common life stressors and the specific stressors in elite sport, and are able to act autonomously according to their values.

Research on Mental Health in Sport Should Broaden the Scope of Assessment
Factors affecting the mental health of elite athletes

In terms of research design, our review findings indicate that the majority of the empirical studies were of a quantitative nature and applied a cross-sectional epidemiological study design [e.g., 2, 16-22, 25, 30-32] using self-reported screening instruments such as the GHQ-12 and the CES-D. These instruments are borrowed from clinical research and are not adapted to the elite sports context and the athletic population. Only two studies [15, 33] used a control group to compare athletes to a comparable peer group in terms of their MH status. Although only 11% of the 43 empirical studies included in this review applied a qualitative research design, these studies added more than half of the correlates making up the personal and sport-environmental protective factors. The qualitative studies emphasize the real and often idiosyncratic experiences that athletes go through during their careers that might influence their well-being in the long run. Similarly, a recent qualitative study by Lebrun and colleagues (2018) demonstrated that the subjective experience of clinical depression can be triggered by sporting and non-sporting reasons, and that the athletes’ sporting performance does not necessarily need to be directly related to their subjective MH state.

The review showed that 37% of the included studies [e.g., 18, 19, 23, 25] investigated the relationship between injury or overtraining and athletes’ MH. Overtraining and burnout can be difficult to distinguish from depression, as some of the symptoms such as fatigue, insomnia, appetite change, weight loss, lack of motivation, and concentration difficulties overlap with each other (Gustafsson, DeFreese, & Madigan, 2017; Reardon & Factor, 2010). However, burnout comes along with “a withdrawal from sport noted by a reduced sense of accomplishment, devaluation/resentment of sport, and physical/psychological exhaustion” (Raedeke, Lunney, & Venables, 2002, p. 181), while athletes with depressive symptoms are still able to perform and can maintain active competitors over a long period (e.g., Michael Phelps).
Factors affecting the mental health of elite athletes

Gouttebarge and colleagues applied a prospective cohort study design in several of their studies [16, 18, 19, 43] in order to determine the prevalence of CMD among rugby, cricket, and soccer players and discovered that it is quite common for athletes to suffer from depression, anxiety, sleep disturbance, or adverse alcohol use simultaneously. Many quantitative studies investigated athletes’ MH in commercial professional sports such as rugby and football, where the risk of (multiple) injuries and concussion is relatively high [e.g., 16, 17, 20, 21]. No qualitative inquiry has yet been made into professional team sports in order to investigate not only risk factors such as adverse life events and injuries for CMD, but also to explore factors fostering athletes’ MH. While recognizing the importance of monitoring athletes’ MH before and after an important event such as the Olympics [18], only one study [26] examined athletes’ MH in relation to preparing for a major sports event and found that after the competition, the number of athletes that met diagnostic criteria for depression was halved compared to pre-competition. The same study [26] was also the only one to use both semi-structured interviews based on the DSM-IV criteria (American Psychiatric Association, 1994) and a quantitative scale in order to establish the presence of a major depressive episode.

Sample characteristics. Although only studies that investigated the elite athlete population in relation to MH were included, the samples reviewed in this study were rather heterogeneous in terms of age, sporting level, type of sports, and level of professionalization, which made it difficult to compare findings across studies. This is a common difficulty in sports research because elite athletes can be further categorized into world-class elite, successful elite, competitive elite, and sub-elite (Swann et al., 2015). Studies often fail to describe their samples accordingly or athletes from different elite categories are included in the same sample [e.g., 3, 4, 32]. In their review, Rice et al. (2016) further criticized the quality of the empirical quantitative
Factors affecting the mental health of elite athletes

studies related to MH and elite athletes and highlighted that participants’ self-selection may
reduce the representativeness of the findings. In terms of genders studied, less than one-third of
the athletes included in this review were female athletes. Some authors emphasize that
professional male athletes are at an increased risk of mental ill-health due to their attitude of
being mentally tough and their inability to seek professional help (Souter et al., 2018). On the
other hand, female athletes, especially in aesthetic and endurance sports [2, 38, 41], are exposed
to specific stressors that promote the female athlete triad syndrome which potentially leads to
other CMDs (Reardon & Factor, 2010).

The results showed that there has been an increased research focus on athletes’ MH in
Europe and Australia/Oceania, while there has been less (Asia) or no (Africa, South America)
investigation of the MH of elite athletes published in the English language. As highlighted by
Park et al. (2012), investigating cultural diversity could help in testing the generality and validity
of existing knowledge and theories and have practical implications, such as providing suitable
and appropriate support in applied work. Since MH support programs and referral practices are
culturally infused and differ substantially even within high-income European countries (Moesch
et al., 2018), it can only be speculated how mental health symptoms/disorders of elite athletes are
managed in low- and middle-income countries, given the lack of research in these contexts.

Mental Health as a Major Resource for the Whole Athletic and Post-Athletic Career

Athletes with high levels of well-being have a better chance of performing well,
particularly over the long term (Henriksen et al., 2019). At the same time, sound mental health is
not a prerequisite for performance, since (some) athletes achieve world-class performances
despite mental health issues and clinically diagnosable disorders (e.g., Michael Phelps, Andre
Agassi, Lindsey Vonn). Within the holistic lifespan perspective, an athlete is conceptualized as a
Factors affecting the mental health of elite athletes

whole person that develops on the athletic, psychological, psychosocial, academic-vocational, and financial level throughout a life career (Wylleman, De Knop, & Reints, 2011). Career transitions are critical phases in an athlete’s career (Stambulova et al., 2009) and especially the junior to senior transition (e.g., Pummel & Lavallee, 2019, Wylleman, Rosier, & De Knop, 2015) and the transition out of elite sport (Kuettel, Boyle, & Schmid, 2017, Park et al., 2013) are phases where athletes (often) perceive a misbalance between their resources and the transition demands. Between 15-20% of athletes are expected to face serious adjustment difficulties including a feeling of loss, identity crises, and distress following athletic retirement (Park et al., 2013). Gouttebarge and colleagues [17, 19, 20] investigated MH among current and former football players and showed that up to 39% of the retired athletes faced MH problems including adverse nutritional and drinking behavior. Employment status and working hours were identified as protective factors for retired footballers [20] indicating – as suggested in the WHO mental health definition – the importance that athletes can work productively and fruitfully, contribute to their community, and find meaning also in life after their elite sports career.

Dual career is experienced by athletes during the periods when they combine sport with education or work (Stambulova & Wylleman, 2019). Even though the student-athletes in Gerber et al. (2011) study reported less stress, better sleep, and fewer depressive and anxiety symptoms than non-athletes [15], it can be assumed that student-athletes, despite experiencing a unique range of stressors (e.g., managing pressure from different stakeholders, role strain) do not differ with respect to reporting depressive symptoms (e.g., Gorczynski et al., 2017; Rice et al., 2016). However, Stambulova and Wylleman (2019) highlighted that research on well-being concerning dual career has just begun (e.g., Sorkkila, Ryba, Aunola, Selänne, & Salmela-Aro, 2017). Further
Factors affecting the mental health of elite athletes

research is needed in order to understand how risk and protective factors affect athletes’ MH in relation to their dual career pathways and challenges during within-career transitions.

Mental Health as a Core Component of a Culture of Excellence – The Influence of the Environment on Athletes’ Mental Health

Within the *holistic ecological perspective* (Henriksen, Stambulova, & Roessler, 2010), the context of athletes’ career development is conceptualized as containing athletic and non-athletic domains within the micro-, meso-, and macro-levels, including athletes’ close environments and factors related to the national culture and sport system. Only three studies [23, 34, 35] investigated the potential influence of the sporting environment on athletes’ MH. However, several studies [e.g., 9, 38, 41] have shown that athletes from certain sports (i.e., weight-sensitive or aesthetic sports) are more prone to develop MH issues, including anxiety and depressive symptoms. These findings are, however, of descriptive nature and tell us little about the influence of the contextualized cultural characteristics (e.g., coaching behavior and style, embedded values) within the respective elite sports environments. Therefore, an increased focus should be placed on the environment in which the athlete develops, since a trusting and mastery-orientated climate – as opposed to ‘winning at all costs’ – has been shown to be beneficial for the MH of young elite athletes (e.g., Ivarsson et al., 2015; Verner-Filion & Vallerand, 2018). Figure 2 shows that competence, autonomy, and relatedness as the three basic human needs (Deci & Ryan, 2000) appear to be essential for facilitating optimal functioning, growth and integration, as well as for the constructive social development and personal well-being of athletes [e.g., 9, 10, 20, 23, 35]. Case studies conducted in Scandinavian cultural contexts have identified some shared features that facilitate athletes’ development and transitions (e.g., Henriksen et al., 2010). For example, development of psychosocial skills, supportive relationships, proximal role models,
Factors affecting the mental health of elite athletes

integrated efforts of the athletes’ close and wider environment, and focus on long-term
development are characteristics that are especially relevant for young athletes to make successful
transitions while maintaining high levels of MH and well-being. Thus, coaches and support staff
need to make sure that they provide an environment where these features are integrated. Further
research is needed to provide a better link between sport-environmental factors and athletes’ MH
in different elite sports sub-cultures all over the world.

There is a general view that athletes who do seek help for psychological problems may be
seen as weak by other athletes and coaches (Souter, Lewis, & Serrant, 2018), and stigma has
been highlighted as a barrier to help-seeking in athletes [4, 23]. However, as Moreland, Coxe,
and Yang (2017) emphasized, many stakeholders (i.e., athlete, coach, teammate, administrators)
and their attributes (i.e., attitudes, opinion, behavior) can either work as facilitators of and/or
barriers to using MH services. The busy athletic schedule can be another barrier why athletes are
reluctant to use mental health services [23]. Help-seeking attitudes within the elite sport are
starting to shift (Souter et al., 2018) and some National Sport Governing Bodies have recently
established a new Mental Health Strategy (e.g., UK Sport) consisting of four key pillars, namely
education, provision, communication, and assurance. Although there is evidence of some support
for the effectiveness of MH awareness programs (Breslin et al., 2017; Sebbens, Hassmén, Crisp,
& Wensley, 2016), further studies are needed in order to review the quality and effectiveness of
such programs and initiatives.

Limitations

This review has several limitations. First, it includes only English language, peer-reviewed
studies. The exclusion of non-English studies might influence sample characteristics (e.g.,
location of study) and lead to the omission of potential correlates that may be culturally
Factors affecting the mental health of elite athletes

significant. Nevertheless, some evidence suggests that restricting the search to studies published in English language may not always be enough to influence systematic review findings (Morisson et al., 2012). As previously described, the inclusion criteria ‘elite athlete’ is not without problems. By excluding studies that investigated collegiate or student-athletes, we risked omitting a significant body of research on athletes’ MH conducted in Northern America. Second, our attempt to structure the MH factors into a personal and sport-environmental domain was not without challenges as many factors are interrelated, therefore, the border between the two domains might be more fluid than displayed in the conceptual map in Figure 2. Third, the division of factors was influenced by our subjective understanding of risk and protective factors based on our common background as sport psychology practitioners working with athletes in different sports and at different career stages. Fourth, we extracted the correlates/associations from the included studies without evaluating them in terms of their impact on mental health or mental ill-health. Hence, factors placed further away from the center in Figure 2 do not necessarily have stronger effects on athletes’ MH. Fifth, by not including the vast literature concerning athletic burnout, we might have missed some important specific factors related to recovery and stress (-reduction) which possibly affect athletes’ mental health. Finally, a general weakness of scoping reviews concerns the lack of quality assessment of the included studies.

Practical Implications for Support Providers

Based on the review findings, several practical implications for MH support providers, sports psychologists, and researchers emerged from this review. Coaches, parents, and peers have been shown to positively influence a range of factors impacting athletes’ development in sport (Sheridan et al., 2014) and as such contribute to athletes’ MH [e.g., 9, 10, 23, 35]. Coaches can foster positive psychosocial development and well-being by helping athletes to learn to
Factors affecting the mental health of elite athletes

respond to the variety of sport-specific stressors in a healthy way (Turnnidge & Côté, 2016).

However, the athletes’ entourage might not always provide the appropriate type of support (e.g., exertion of extra pressure, lack of understanding) and this can have a potentially negative effect on athletes’ MH [e.g., 17, 22, 40]. Therefore, coaches and practitioners should be empowered with relevant information so that they recognize the importance of creating an environment that supports MH, helping athletes sustain mentally healthy in elite sport. Accordingly, the conceptual map (Figure 2) could be used as an orientation tool for practitioners in order to enhance athletes’ MH.

Future Directions

Several research directions can be identified with regard to research design. Most of the quantitative studies included have used instruments that have not been modified for the athletic population. In the future, instruments should be adapted to the sports context (e.g., Baron et al., 2013; Foster & Chow, 2019) and researchers investigating athletes’ MH should use similar instruments so that it is possible to compare MH between different athletic populations. The majority of researchers have used retrospective data collection methods, which may have negatively affected the data recall process. Employing a prospective longitudinal design to study how an athlete’s MH state evolves during their sports career would allow researchers to examine dynamic interpersonal processes and changes over time, for example during critical career transitions (Kuettel et al., 2017; Pummell & Lavallee, 2019). Therefore, more prospective longitudinal studies, as well as qualitative studies, are required in the study area across cultures.

Given that a positive personality is an important part of resilience (Sarkar & Fletcher, 2014), further research needs to be conducted on how personality (cf. Coulter, Mallett, Singer, & Gucciardi, 2016) influences athletes’ MH and well-being inside and outside the elite sport.
Factors affecting the mental health of elite athletes

domain. Since athletes’ individual behavior can be either protective [e.g., 10, 23, 35] or
maladaptive [e.g., 9, 27, 34, 39] for their MH, appropriate coping strategies and developing
resilience can help athletes to deal with stressors both in the personal domain and the sport-
environmental domain (Lebrun et al., 2018). As such, strategies that are directed towards
promoting mental health (rather than reducing the incidence of mental illness) should be
developed by the athletes and supported by their personal and sporting environment. The
conceptual map displayed in Figure 2 could in future studies be utilized as a conceptual
framework to investigate athletes’ MH. However, more research is needed in order to improve
the understanding how dispositional (e.g., genetics, family history), triggering (e.g., critical life
events), psychological (e.g., personality, intelligence), social (e.g., poverty, milieu), and
protective and risk factors interplay in relation to athletes’ well-being and mental illness.

Conclusions

Elite athletes are exposed to a unique range of risk factors (e.g., injury and overtraining,
constant pressures to perform) that may potentially increase their vulnerability to mental ill-
health. On the other hand, both personal (e.g., acceptance of multiple roles, appropriate recovery)
and sport-environmental protective factors (e.g., reducing stigma, climate of trust) can contribute
to athletes’ MH and well-being. Unlike previous reviews, the present scoping review has focused
specifically on factors affecting athletes’ MH providing a visual overview of factors that
potentially foster or hamper elite athletes’ MH. The findings indicate that the majority of the
empirical studies are of quantitative nature and apply a cross-sectional epidemiological study
design using self-reported screening instruments. No qualitative inquiry has yet been made into
professional team sports in order to investigate risk factors such as adverse life events and
Factors affecting the mental health of elite athletes

injuries for CMD, but also to explore factors fostering athletes’ MH. There is also a lack of studies that investigate the potential influence of the sporting environment on athletes’ MH.

Our scoping review provides original contributions to the body of research by providing an overview and a structure of the factors related to athletes’ MH in a conceptual map. By thematically synthesizing findings from quantitative and qualitative studies, our review advanced knowledge by reducing the complexity of factors that potentially affect athletes’ MH. To have a better understanding of risk and protective factors in relation to athletes’ MH is not only important for practitioners working with athletes, but also for researchers that intend to investigate athletes’ MH in future studies. Insofar, the current review has contributed to the evolving discourse about MH in elite sport and intends to spur discussion on how we can better understand, measure, and support athletes’ MH.

Acknowledgments

We are grateful to Anne Faber Hansen for her help with the literature search. We thank Professor Natalia Stambulova and Anna Daudert for their constructive inputs during the process and their feedback on earlier drafts of this manuscript.

Funding

This review was partly supported by a grant from Team Denmark.
Factors affecting the mental health of elite athletes

References


Factors affecting the mental health of elite athletes


Factors affecting the mental health of elite athletes


Factors affecting the mental health of elite athletes

Hartling, L., Featherstone, R., Nuspl, M., Shave, K., Dryden, D. M., & Vandermeer, B. (2017). Grey literature in systematic reviews: a cross-sectional study of the contribution of non-English reports, unpublished studies and dissertations to the results of meta-analyses in child-relevant reviews. *BMC Medical Research Methodology, 17*(1), 64.


Factors affecting the mental health of elite athletes


Factors affecting the mental health of elite athletes


Factors affecting the mental health of elite athletes


Note: Studies that are underlined were included in the present systematic review.
Records identified via databases \((n = 3155)\)

- SPORTDiscus \((n = 619)\)
- SCOPUS \((n = 259)\)
- PsycINFO \((n = 713)\)
- EMBASE \((n = 1187)\)
- PubMed \((n = 377)\)

Records identified from 1998-May 2018 \((n = 2782)\)

Records before year 1998 removed \((n = 373)\)

Records after removing duplicates \((n = 2410)\)

Duplicates removed \((n = 372)\)

After irrelevant titles removed \((n = 2224)\)

Abstracts screened \((n = 186)\)

Removed after reading abstract \((n = 112)\)

Full-text not available or not in English \((n = 10)\)

Full-text articles screened for eligibility \((n = 64)\)

Removed because did not meet inclusion criteria \((n = 18)\):
- Editorial/commentary/research note \((n = 6)\)
- Elite sport population not met \((n = 8)\)
- Not specifically about mental health \((n = 4)\)

Review-type papers included \((n = 9)\)

Empirical articles included in the scoping review \((n = 43)\)

Articles added after reading references of obtained articles \((n = 6)\)

Figure 1. Study selection flow diagram
Figure 2. Conceptual map of protective and risk factors related to elite athletes’ mental health. Numbers in brackets indicate numbers of correlates/associations.
A Brief Summary of The Identified Review-Type Papers on Athletes’ Mental Health (MH) (in chronological order)

<table>
<thead>
<tr>
<th>Reference (year)</th>
<th>Aims/focus of the review</th>
<th>Type of review/ Amount of the included studies/ Databases</th>
<th>Contribution and main findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reardon &amp; Factor (2010)</td>
<td>To discuss the current state of knowledge of psychiatric diagnoses in athletes.</td>
<td>This systematic review included 103 papers through a MEDLINE search with a focus on disorders and illness.</td>
<td>The article reviews the athletic population in terms of mood, anxiety, eating, attention-deficit, addictive, and other disorders and provides clinical treatment methods for athletes suffering from such disorders.</td>
</tr>
<tr>
<td>Glick et al. (2012)</td>
<td>To provide professional and ethical quandaries that arise in treating elite athletes with psychiatric issues.</td>
<td>Type of review not specified. MEDLINE search for articles discussing psychiatric diagnosis/treatment of athletes.</td>
<td>Active and retired athletes have psychiatric problems and disorders like non-athletes and require diagnosis and treatment to function in their sport and in the rest of their lives. Practical implications for psychiatrists working with elite athletes are provided.</td>
</tr>
<tr>
<td>Bär &amp; Markser (2013)</td>
<td>To discuss the issue of the sports specificity of selected mental diseases in elite athletes.</td>
<td>Thematic narrative review of 57 articles on sport-specific mental disorders (search not reported).</td>
<td>The prevalence of psychiatric conditions among elite athletes is still under debate. Further research on psycho-social factors is needed to better understand the sports specificity of the etiology of mental disorders in high-performance athletes.</td>
</tr>
<tr>
<td>Rice et al. (2016)</td>
<td>To appraise MH and wellbeing of elite-level athletes, including the incidence and/or nature of mental ill-health and substance use.</td>
<td>Narrative systematic review of 60 articles identified through systematic search in PubMed, EMBASE, SPORTDiscus, PsycINFO, Cochrane and Google Scholar.</td>
<td>Elite athletes experience a unique range of stressors (injury, overtraining and burnout; intense public and media scrutiny; managing ongoing competitive pressures to perform) that may potentially increase their vulnerability to mental ill-health. More high-quality epidemiological and intervention studies are needed.</td>
</tr>
<tr>
<td>Breslin et al. (2017)</td>
<td>To determine the effect of sport-specific MH awareness programs and to review the study quality and effectiveness of programs.</td>
<td>Systematic review of ten studies related to mental health awareness programs for athletes/coaches. Search in PsycINFO, MEDLINE, Scopus, Cochrane, CINAHL, SPORTDiscus.</td>
<td>Some support was found for the effectiveness of the MH programs available. However, a cautionary approach must be taken when determining an effective program, as studies demonstrated a high risk of bias and showed a limited validity in the outcome measures of mental health knowledge and referral efficacy.</td>
</tr>
<tr>
<td>Gorczynski, Coyle, &amp; Gibson (2017)</td>
<td>To assess the prevalence of mild or more severe depressive symptoms between high-performance athletes and non-athletes.</td>
<td>Comparative meta-analysis of 5 studies. Systematic search in PubMed PsycINFO, MEDLINE, CINAHL, SPORTDiscus, and Google Scholar.</td>
<td>High-performance athletes and non-athletes do not differ with respect to reporting mild or more severe depressive symptoms. The rates of mild or more severe depressive symptoms ranged from 3.7% to 26.7% for high-performance athlete males and from 9.8% to 36.5% for high-performance athlete females.</td>
</tr>
<tr>
<td>Gucciardi, Hanton, &amp; Fleming (2017)</td>
<td>To evaluate theory and evidence regarding the thesis that MH and mental toughness are contradictory concepts in elite sport.</td>
<td>Narrative review and critical evaluation of authors’ own published articles and additionally 15 papers related to the two concepts.</td>
<td>Mental toughness may represent a positive indicator of MH, or facilitate its attainment, rather than be at odds with. However, there is no research that has directly tested this thesis in elite athletes. The notion that mental health and mental toughness are contradictory concepts in elite sport may be too simplistic.</td>
</tr>
<tr>
<td>Schinke, Stambulova, Si, &amp; Moore (2017)</td>
<td>To consider what is known about MH to spur dialogue, contribution to research and services that support aspiring athletes’ MH.</td>
<td>Position stand, narrative-type review of international literature on athletes’ MH (details of search or number of articles not specified).</td>
<td>Mental health of athletes is reviewed under elite athlete trends, athletes’ performance, overtraining and injury, career development, culture and identity, and health-related interventions. Ten postulates are provided to spur further discussions on how to make athletes healthier and, thus, more resourceful for (and through) sport.</td>
</tr>
<tr>
<td>Moesch et al. (2018)</td>
<td>To enhance awareness of the MH topic and to critically discuss optimal service provision for athletes.</td>
<td>Position statement. Type of review not specified. Models of service provision of six European countries are presented, 5 studies are compared.</td>
<td>Competencies, certification issues and professional boundaries of the involved service providers differ considerably between different European countries. The models of service provision presented should stimulate reflections on optimal support in one's own country.</td>
</tr>
</tbody>
</table>
### Table 2

**Overview of the 43 Empirical Articles Included in the Systematic Literature Review on Mental Health (MH) of Elite Athletes (alphabetically)**

<table>
<thead>
<tr>
<th>Author(s) (year) [study number]</th>
<th>Aims and major focus of the study</th>
<th>N (female:male)</th>
<th>Age of athletes</th>
<th>Sport(s) Location/Context</th>
<th>Research design</th>
<th>MH protective correlates/associations</th>
<th>MH risk correlates/associations</th>
<th>Main findings/contributions</th>
</tr>
</thead>
</table>
SD = 2.0  
Various sports  
USA | Quantitative  
Cross-sectional | - Injury  
- Female | Both athlete- and clinician-rated depression symptoms decreased over time. Women, regardless of injury status, exhibited greater depression symptom severity than men in clinical interviews. |
Various sports  
New Zealand | Quantitative  
Cross-sectional | - Individual sport  
- Retirement uncertainty  
- Perceived life stress  
- Female  
- Age below 25  
- Centralization | 21% of elite athletes met the criteria for moderate symptoms of depression with 8.6% meeting the suggested criteria for a major depressive episode. Athletes under 25 were more likely to identify depressive symptoms. |
SD = 5.05  
Various sports  
Germany | Quantitative  
Cross-sectional | - Age under 18  
- Back pain | Depending on the instrument 7.1% and 9.1% of athletes were screened positive for depression. Athletes <18 were lower in socio-emotional stress and higher in psychological wellbeing. Performance stress and risk for depression were predictors of back pain intensity and disability. |
Various sports  
UK | Mixed-method  
Three-round Delphi method design | Athletes:  
- Own pressure  
- Fair of failure  
- Injury | There are differences between coaches and athletes in terms of beliefs about the prevalence of mental-health issues. A general consensus that stigma and other dynamics collude to create barriers to access support. |
| Biggins et al. (2018) [5]      | Assess the sleep profiles of elite Gaelic athletes and to compare wellbeing in relation to sleep profiles | 69 (0:69) | M = 22.7  
SD = 4.1  
Gaelic football and hurling  
Ireland | Quantitative  
prospective observational study | - Poor sleep | Poor sleepers had significantly increased subjective health complaints, increased stress, and increased confusion-bewilderment. |
| Blakelock, Chen, & Prescott (2016) [6] | Establish the prevalence of clinical levels of psychological distress in elite adolescent male soccer players following deselection | 91 (0:91) | M = 16.31  
SD = 1.10  
Soccer  
UK | Quantitative  
Cross-sectional | - Deselection | Results of this study suggested that deselected players experienced significantly higher levels of distress than retained players at post-selection time points and that deselection was the antecedent of such distress. |
| Breslin et al. (2018) [7]      | Determine whether providing an MH awareness program to | 100 (41:59) | M = 20.78  
SD = 2.91 | Quantitative  
Cross-sectional | - MH awareness program | MH awareness program improved athletes’ knowledge of MH and their likelihood to engage and offer support to someone with an |
<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Sample Size</th>
<th>Study Design</th>
<th>Data Collection</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celebi et al., (2015)</td>
<td>Evaluate early phase depression and anxiety in the professional athletes who underwent anterior cruciate ligament reconstruction</td>
<td>38 (3:35) M = 26.84 SD = 8.03 Various sports Turkey</td>
<td>Quantitative Cross-sectional</td>
<td>- ACL injury had no impact on depression and anxiety in the recovery process</td>
<td>Levels of depression and anxiety were below the diagnostic cutoff values. This is a rather unexpected finding since ACL injury is a very serious injury that threatens professional sports careers.</td>
</tr>
<tr>
<td>Coyle, Cecel, &amp; Gibson (2017)</td>
<td>Explore what MH (behaviors) mean for a group of young elite athletes as conditioned by their peculiar social context as elite athletes</td>
<td>8 (6:2) Range: 14y-24y Diving UK</td>
<td>Qualitative Thematic analysis</td>
<td>- Access to support (family, peers, and coaches) - Access to specialist support (psychologist) - Body image and eating habits - Stress and anxiety, fear of injury - Pressure through expectations and sponsoring</td>
<td>Participants demonstrated relatively limited knowledge of MH. However, participants identified a range of risks to MH which are broadly aligned with risk factors acknowledged within existing literature including.</td>
</tr>
<tr>
<td>Doherty, Hannigan, &amp; Campbell (2016)</td>
<td>Explore how current/former elite male athletes experience depression during their sporting careers</td>
<td>8 (0:8) M = 40.38 SD = 14.7 Various sports Ireland</td>
<td>Qualitative Skype and face-to-face interviews</td>
<td>- Channeling sporting will toward recovery - Experiencing acceptance - Positive therapeutic relationship - Support from significant others - Developing hope - Extreme athletic identity - Sporting pressure - Extrinsic motivations - External locus of evaluation - Perceived precipitating factors for depression</td>
<td>Masculine values, commitment to excellence, and high levels of athletic identity which were embraced by the athletes and reinforced by the elite sporting environment played a role in the development and maintenance of their depression.</td>
</tr>
<tr>
<td>Drew et al. (2017)</td>
<td>Establish the prevalence of illness symptoms, poor sleep quality, poor MH symptoms, and stress-recovery state in an Olympic cohort</td>
<td>132 (85:47) M = 25.05 SD = 4.0 Various sports Ireland</td>
<td>Quantitative Cross-sectional</td>
<td>- Upcoming major sports event (e.g., preparation towards the Olympics)</td>
<td>The point prevalence of poor MH was 14%-17% and poor sleep quality was 49%. High point prevalence of athlete self-reported illnesses in the preparations (3 months prior) was found in this cohort.</td>
</tr>
<tr>
<td>Du Preez et al. (2017)</td>
<td>Investigate the prevalence of mental illness in elite rugby athletes and exploring potential risk factors to mental illness</td>
<td>404 (0:404) Age&gt;18 Rugby Australia</td>
<td>Qualitative Cross-sectional</td>
<td>- Concussion</td>
<td>Prevalence of depression was 12.6% pre-season and 10% in-season. Prevalence of generalized anxiety disorder was 14.6% and 10% for these 2 periods. Overall, 68.6% of players had a hazardous level of alcohol use pre-season and 62.8% in-season.</td>
</tr>
<tr>
<td>Foskett &amp; Longstaff (2017)</td>
<td>Investigate the prevalence of signs of anxiety and depression and distress among UK elite</td>
<td>143 (61:81) M = 24.0 SD = 8.6 Various sports UK</td>
<td>Quantitative Cross-sectional</td>
<td>- Career satisfaction - Female for distress but not on anxiety/depression</td>
<td>47.8% of the athletes showed signs of anxiety/depression and 26.8% signs of distress. 17.3% of male athletes and 39.3% of female athletes reporting signs of distress.</td>
</tr>
<tr>
<td>Frank, Nixdorf, &amp; Beckmann (2017)</td>
<td>Explore how depression and burnout are related in athletes</td>
<td>194 (7:7) M = 15.08 SD = 1.95 Various sports Germany</td>
<td>Quantitative Cross-sectional</td>
<td>- Recovery - Chronic stress</td>
<td>Burnout and depression can cause each other to some degree and no particular direction can be specifically supported by the current study.</td>
</tr>
<tr>
<td>Reference</td>
<td>Methodology</td>
<td>Prevalence</td>
<td>Risk Factors</td>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------------</td>
<td>--------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Gerber et al. (2011) [15]</td>
<td>Examine whether participation in elite sport interacts with stress in decreasing or increasing symptoms of depression</td>
<td>Various sports Switzerland</td>
<td>Quantitative Cross-sectional</td>
<td>- Female&lt;br&gt;- Stress&lt;br&gt;- Low quality of sleep</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge, Aoki, Verhagen, &amp; Kerkhoffs (2017) [16]</td>
<td>Determine the incidence of symptoms of CMD among male professional rugby players and to explore their association with potential stressors</td>
<td>Rugby International</td>
<td>Quantitative Observational prospective cohort study</td>
<td>- Adverse life events</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge et al. (2015) [17]</td>
<td>Determine the prevalence of MH problems and psychosocial difficulties in current and former professional footballers</td>
<td>Various sports Netherlands</td>
<td>Quantitative Cross-sectional</td>
<td>- Adverse life events&lt;br&gt;- Low social support from teammates&lt;br&gt;- Retirement</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge, Jonkers, et al. (2017) [18]</td>
<td>Establish the 12-month incidence of symptoms of CMD among Dutch elite athletes and to explore their potential association with stressors</td>
<td>Various sports Ireland</td>
<td>Quantitative Observational prospective cohort study</td>
<td>- Career dissatisfaction&lt;br&gt;- Injury&lt;br&gt;- Critical life events</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge, Tol, &amp; Kerkhoffs, (2016) [19]</td>
<td>Determine the prevalence, comorbidity and 6-month incidence of symptoms of CMD among elite Gaelic athletes</td>
<td>Hurling and football Ireland</td>
<td>Quantitative Observational prospective cohort study</td>
<td>- Severe injury&lt;br&gt;- Sports career dissatisfaction&lt;br&gt;- Critical life events</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge, Aoki, et al. (2016) [20]</td>
<td>Explore the relationship of level of education, employment status with symptoms of CMD among current and retired professional footballers</td>
<td>Soccer International</td>
<td>Quantitative Cross-sectional</td>
<td>- Employment status for retired players&lt;br&gt;- Number of working hours for retired players</td>
<td></td>
</tr>
<tr>
<td>Gouttebarge, Jonkers, Moen, et al. (2017) [22]</td>
<td>Determine the prevalence of CMD among current and former Dutch elite athletes, and to explore potential risk indicators</td>
<td>Various sports Holland</td>
<td>Quantitative Cross-sectional</td>
<td>Prevalence (4-week) 6% for adverse alcohol use to 45% for anxiety/depression among current elite athletes, and from 18% for distress to 29% for anxiety/depression among former elite athletes.</td>
<td></td>
</tr>
<tr>
<td>Study Authors &amp; Year</td>
<td>Methodology</td>
<td>Sample Characteristics</td>
<td>Main Findings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------</td>
<td>------------------------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gulliver, Griffiths, &amp; Christensen (2012) [23]</td>
<td>Qualitative Focus group interviews</td>
<td>15 (6:9) M = 19.3 One individual and one team sport Australia</td>
<td>Determine what young elite athletes perceive as the barriers and facilitators to help-seeking for common MH problems.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gulliver et al. (2012) [24]</td>
<td>Quantitative Randomized controlled trial</td>
<td>59 (43:16) M = 25.42 SD = 5.64 Various sports Australia</td>
<td>Test the feasibility and efficacy of three Internet-based interventions designed to increase MH help-seeking attitudes and behavior.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jensen et al. (2018) [27]</td>
<td>Quantitative Cross-sectional</td>
<td>323 (0:323) M = 22.08 SD = 5.15 Soccer Denmark &amp; Sweden</td>
<td>Investigate the relation of perfectionism and anxiety to depressive symptoms in Danish and Swedish male elite football players.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones (2016) [28]</td>
<td>Quantitative Cross-sectional</td>
<td>112 (0:112) Wide age range NFL football USA</td>
<td>Investigate how personal characteristics and individual athletic-related characteristics correlate with MH attitudes in elite football players.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Sample Size</td>
<td>Sample Description</td>
<td>Methodology</td>
<td>Findings</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------------</td>
<td>--------------------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>Junge &amp; Feddermann-Demont (2016) [30]</td>
<td>Quantitative Cross-sectional</td>
<td>471 (182:289)</td>
<td>22.3 M, 4.47 SD</td>
<td>Female, Injury, Players position, Levels of play</td>
<td>Swiss football players have the same prevalence of depression as the general population, while male U-21 players have a higher prevalence of depression.</td>
</tr>
<tr>
<td>Junge &amp; Prinz (2018) [31]</td>
<td>Quantitative Cross-sectional</td>
<td>290 (290:0)</td>
<td>21.5 M, 4.2 SD</td>
<td>Age (younger), Low match experience, Playing in second league, Poor general health</td>
<td>16.6% of the players expressed moderate and 14.1% severe symptoms of depression. Second league female football players had a higher prevalence of depression symptoms.</td>
</tr>
<tr>
<td>Kilic et al. (2017) [32]</td>
<td>Quantitative Cross-sectional</td>
<td>1155 (249:906)</td>
<td>25.5 M, 4.7 SD</td>
<td>Severe injuries, Surgeries, Critical life events</td>
<td>19% of soccer players expressed anxiety/depression symptoms. In professional handball, the highest prevalence (4 weeks) of symptoms of CMD was 26% and 16% for anxiety/depression among current and retired players, respectively.</td>
</tr>
<tr>
<td>Klinkowski et al. (2008) [33]</td>
<td>Quantitative Cross-sectional</td>
<td>51 (51:0)</td>
<td>15.2 M, 1.8 SD</td>
<td>Gymnastics Germany</td>
<td>No psychological distress comparable to that of anorectic patients was found. Gymnasts suffered less from psychological distress than the patient group and showed even fewer symptoms than the high school student group.</td>
</tr>
<tr>
<td>Lundqvist &amp; Raglin (2015) [34]</td>
<td>Quantitative Cross-sectional</td>
<td>103 (54:49)</td>
<td>22.3 M, 4.4 SD</td>
<td>Orienteering Sweden</td>
<td>Distinct patterns of well-being and stress levels could be identified with reasonable accuracy (88%) by five variables: Need satisfaction, Self-esteem, Mastery-orientated climate, Need dissatisfaction, Perfectionistic concerns.</td>
</tr>
<tr>
<td>Lundqvist &amp; Sandin (2014) [35]</td>
<td>Qualitative Semi-structured interviews</td>
<td>10 (6:4)</td>
<td>Median age: 20.4</td>
<td>Orienteering Sweden</td>
<td>Subjective and psychological well-being interacted, and important psychological functioning among athletes included the abilities to adopt value-driven behaviors, be part of functional relationships, and to self-regulate one’s autonomy.</td>
</tr>
<tr>
<td>Mousavi, Mousavi, &amp; Yaghubi (2017) [36]</td>
<td>Quantitative Cross-sectional</td>
<td>385 (100:285)</td>
<td>23.25 M, 3.11 SD</td>
<td>Mature defense mechanism, Neurotic defense mechanism</td>
<td>A significant positive relationship between mature defense mechanisms with psychological wellbeing was revealed. Neurotic defense mechanism was significantly associated with psychological distress.</td>
</tr>
<tr>
<td>Study</td>
<td>Research Question</td>
<td>Sample Characteristics</td>
<td>Methodology</td>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------------------</td>
<td>------------------------</td>
<td>-------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Newman, Howells, &amp; Fletcher (2016) [37]</td>
<td>Explore the depressive experiences of top-level athletes</td>
<td>Age not specified</td>
<td>Qualitative Thematic analysis of autobiographies</td>
<td>Sport as a way to escape from distress, Sports success, MH literacy, Critical life event, Multiple injuries, Social anxiety, Sporting failure, Extreme demands, Perfectionism. The findings display a two-way interaction, with depression having implications for performance, and performance having implications for depression.</td>
<td></td>
</tr>
<tr>
<td>Nixdorf, Frank, &amp; Beckmann (2016) [38]</td>
<td>Examined if athletes in individual sports are more prone to depressive symptoms than athletes in team sports</td>
<td>Various sports Germany</td>
<td>Quantitative Cross-sectional</td>
<td>- Individual sport - Negative attribution after failure. Athletes in individual sports showed higher scores in depressive symptoms than athletes in team sports. Attribution plays an important role in explaining the different vulnerability to depression in team and individual sports.</td>
<td></td>
</tr>
<tr>
<td>Nixdorf et al. (2013) [39]</td>
<td>Provide insight into the prevalence of depressive symptoms among German elite athletes and possible associated factors</td>
<td>Various sports Germany</td>
<td>Quantitative Cross-sectional</td>
<td>- Situation control - Addressing oneself in encouraging tones - Recovery - Chronic stress - Negative coping strategies. Prevalence of depression was 19%. General stress and sport-specific stress show positive correlations with depressive symptoms, whereas general recovery and sport-specific recovery show significant negative correlations with depressive symptoms.</td>
<td></td>
</tr>
<tr>
<td>Prinz, Dvorak, &amp; Junge (2016) [40]</td>
<td>Evaluate depression symptoms during and after the career in former female football players of the German First League.</td>
<td>Various sports Germany, Europe</td>
<td>Quantitative Cross-sectional</td>
<td>- Athletic retirement - Future plans - Playing position - Conflicts with coach or management; - Injury - Low performance - Lack of support - Separation/divorce - Critical life event. Overall, 20.2% of women had at least one psychopathology, against 15.1% in men. This female predominance applied to anxiety and eating disorders, depression, sleep problems and self-harming behaviors.</td>
<td></td>
</tr>
<tr>
<td>Schaal et al. (2011) [41]</td>
<td>Identify the principal psychological problems encountered within French high-level athletes, and the prevalence based on sex and the sport practiced.</td>
<td>Various sports France, Europe</td>
<td>Quantitative Cross-sectional</td>
<td>- Female - Younger for prevalence - Older age for depression - Aesthetic and fine motor skills sports. Overall, 32.3% of players had symptoms of major depression, and 25.2% of mild or moderate depression at least once during their football career. The average depression score differed significantly between playing positions and levels of play.</td>
<td></td>
</tr>
<tr>
<td>Schuring, Aoki, et al. (2017) [42]</td>
<td>Establish the association between osteoarthritis and CMD in former elite athletes</td>
<td>Various sports International</td>
<td>Quantitative Cross-sectional</td>
<td>- Osteoarthritis Osteoarthritis might be a risk factor for common mental disorders in athletes, as significant association with symptoms of distress, sleep disturbance, alcohol use, and CMD in former elite athletes was found.</td>
<td></td>
</tr>
<tr>
<td>Schuring, Kerkhoffs et al. (2017) [43]</td>
<td>Determine the prevalence of CMD among current and former professional cricketers</td>
<td>Cricket International (Europe and Africa)</td>
<td>Quantitative Observational prospective cohort study with a follow-up</td>
<td>- Surgeries - Adverse life events - Career dissatisfaction Prevalence of 38% for CMD symptoms among current professional cricketers was found. Significant associations between career dissatisfaction and distress, anxiety/depression and sleep disturbance, between surgeries and distress, and between adverse life events and anxiety/depression.</td>
<td></td>
</tr>
</tbody>
</table>

*Note. CMD = Common mental disorder; MH = Mental health.*
Table 3
Research Design and Sample Characteristics

<table>
<thead>
<tr>
<th>Study characteristics</th>
<th>Reference number</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Design</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative</td>
<td>1, 2, 3, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 36, 38, 39, 40, 41, 42, 43</td>
<td>36</td>
<td>84</td>
</tr>
<tr>
<td>Qualitative</td>
<td>9, 10, 23, 35, 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed-method</td>
<td>4, 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-sectional</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42</td>
<td>39</td>
<td>91</td>
</tr>
<tr>
<td>Longitudinal</td>
<td>16, 18, 19, 43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Size</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤10</td>
<td>9, 10, 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-50</td>
<td>4, 8, 23, 26, 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-100</td>
<td>5, 6, 7, 24, 29, 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>101-300</td>
<td>1, 2, 3, 11, 13, 14, 17, 18, 19, 25, 27, 28, 31, 34, 38, 39, 40, 42</td>
<td>18</td>
<td>42</td>
</tr>
<tr>
<td>&gt;300</td>
<td>12, 15, 16, 20, 21, 22, 30, 32, 36, 41, 43</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>31, 33, 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5, 6, 10, 12, 16, 17, 19, 20, 21, 27, 28, 42</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td>Combined</td>
<td>1, 2, 3, 4, 7, 8, 9, 11, 13, 15, 23, 24, 25, 26, 29, 30, 32, 34, 35, 36, 37, 39, 41, 43</td>
<td>24</td>
<td>65</td>
</tr>
<tr>
<td>Not specified</td>
<td>14, 18, 22, 38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elite</td>
<td>1, 2, 6, 7, 9, 10, 13, 14, 15, 18, 22, 23, 24, 25, 26, 29, 33, 34, 35, 36, 38, 39, 42</td>
<td>23</td>
<td>53</td>
</tr>
<tr>
<td>Professional</td>
<td>5, 8, 11, 12, 16, 17, 19, 20, 21, 27, 28, 30, 31, 40, 43</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>Mixed</td>
<td>3, 4, 32, 37, 41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Sport</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team</td>
<td>5, 6, 12, 16, 17, 19, 20, 21, 27, 28, 30, 31, 32, 40, 42, 43</td>
<td>16</td>
<td>37</td>
</tr>
<tr>
<td>Individual</td>
<td>9, 26, 33, 34, 35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined</td>
<td>1, 2, 3, 4, 7, 8, 10, 11, 13, 14, 15, 18, 22, 23, 24, 25, 29, 36, 37, 38, 39, 41</td>
<td>22</td>
<td>51</td>
</tr>
<tr>
<td>Athletic Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 18, 19, 21, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 41</td>
<td>34</td>
<td>79</td>
</tr>
<tr>
<td>Retired</td>
<td>40, 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>10, 17, 20, 22, 28, 37, 43</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Age</td>
<td>14, 33, 38</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>&lt;16</td>
<td>1, 3, 5, 6, 7, 8, 9, 11, 13, 15, 16, 19, 20, 21, 23, 24, 25, 26, 27, 29, 30, 31, 32, 34, 35, 36, 39, 41</td>
<td>28</td>
<td>63</td>
</tr>
<tr>
<td>16-26</td>
<td>4, 17, 18, 32, 40, 42</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>&gt;40</td>
<td>10</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Wide age range</td>
<td>2, 22, 28, 43</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Undefined</td>
<td>12, 37</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

| Location/Context | 3, 4, 5, 6, 7, 9, 10, 13, 14, 15, 18, 19, 22, 27, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41 | 26 | 60 |
| Europe       | 1, 2, 11, 12, 23, 24, 25 | 7  | 16 |
| Australia/Oceania | 26, 28          | 2  | 5  |
| North America | 8, 36           | 2  | 5  |
| Asia         | 16, 17, 20, 21, 42, 43 | 6  | 14 |

Note. Percentages (%) in relation to the total number of included empirical articles ($N = 43$). Reference numbers: 1 = Appaneal, Levine, Perna, & Roh (2009); 2 = Beable, Fulcher, Lee, & Hamilton (2017); 3 = Belz, Heidari, Levenig, Hasenbring, Kellmann, & Kleinert (2018); 4 = Biggin, Burns, & Uphill (2017); 5 = Biggins, Cahalan, Comyns, Purtill, & O’Sullivan (2018); 6 = Blakelock, Chen, & Prescott (2016); 7 = Breslin, Shannon, Haughey, Donnelly, & Leavey (2017); 8 = Celebi, Baskak, Saka, Devrimci Ozguven, Ulkar, & Atlar (2015); 9 = Coyle, Gorczynski, & Gibson (2017); 10 = Doherty, Hannigan, & Campbell (2016); 11 = Drew et al. (2018); 12 = Du Preez, Graham, Gan, Moses, Ball, & Kuah (2017); 13 = Foskett & Longstaff (2017); 14 = Frank, Nixdorf, & Beckmann (2017); 15 = Gerber, Holsboer-Trachsler, Pulse, & Brand (2011); 16 = Gouttebarge, Aoki, Verhagen, & Kerkhoffs (2017); 17 = Gouttebarge, Frings-Dresen, & Sluiter (2015); 18 = Gouttebarge, Jonkers, Moen, Verhagen, Wylleman, & Kerkhoffs, (2017); 19 = Gouttebarge, Tol, & Kerkhoffs (2016); 20 = Gouttebarge, Aoki, Verhagen, & Kerkhoffs (2016); 21 = Gouttebarge, Hopley, Kerkhoffs, Verhagen, Viljoen, Wylleman, & Lambert (2017); 22 = Gouttebarge, Jonkers, Moen, Verhagen, Wylleman, & Kerkhoffs (2017); 23 = Gulliver, Griffiths, & Christensen (2012); 24 = Gulliver et al. (2012); 25 = Gulliver, Griffiths, Mackinnon, Batterham, & Stanimirovic (2015); 26 = Hammond, Gialloretto, Kubas, & Davis (2013); 27 = Jensen, Ivarsson, Fallby, Dankers, & Elbe (2018); 28 = Jones (2016); 29 = Jowett & Cramer (2009); 30 = Junge & Feddermann-Demont (2016); 31 = Junge & Prinz (2018); 32 = Kilic, Aoki, Haagensen, Jensen, Johnson, Kerkhoffs, & Gouttebarge (2017); 33 = Klinkowski, Korte, Pfeiffer, Lehmkul, & Sallbach-Andreae (2008); 34 = Lundqvist & Raglin (2015); 35 = Lundqvist & Sandin (2014); 36 = Mousavi, Mousavi, & Yaghubi (2017); 37 = Newman, Howells, & Fletcher (2016); 38 = Nixdorf, Frank, & Beckmann (2016); 39 = Nixdorf, Frank, Hautzinger, & Beckmann (2013); 40 = Prinz, Dvorak, & Junge (2016); 41 = Schaal et al. (2011); 42 = Schuring, Aoki, Gray, Kerkhoffs, Lambert, & Gouttebarge (2017); 43 = Schuring, Kerkhoffs, Gray, & Gouttebarge (2017)
<table>
<thead>
<tr>
<th>Factor themes</th>
<th>Reference number</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal Protective Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective behavior</td>
<td>10, 23, 35, 36, 39</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td>Feeling of competence</td>
<td>20, 34, 35, 37, 39</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Positive social relationships and support</td>
<td>9, 10, 23, 28</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Recovery</td>
<td>10, 14, 37, 39</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Feeling of autonomy</td>
<td>35, 40</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Basic needs and career satisfaction</td>
<td>13, 34</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Sport-Environmental Protective Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health literacy and support</td>
<td>7, 9, 10, 23, 24, 37</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Trusting and mastery-orientated climate</td>
<td>23, 34, 35</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Successful retirement adjustment</td>
<td>20, 28, 40</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Positive sporting relationships and support</td>
<td>23, 35</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Personal Risk Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury and overtraining</td>
<td>1, 3, 4, 8, 12, 18, 19, 22, 23, 25, 28, 30, 32, 37, 40, 43</td>
<td>16</td>
<td>37</td>
</tr>
<tr>
<td>Risk behavior and ineffective coping</td>
<td>4, 9, 10, 23, 27, 34, 36, 37, 38, 39</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>Adverse life events</td>
<td>16, 17, 18, 19, 22, 32, 37, 40, 43</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>1, 2, 13, 15, 26, 30, 41</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Poor general health</td>
<td>3, 28, 31, 37, 42</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Maladaptive personality traits and identity</td>
<td>10, 27, 28, 34, 37</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Basic needs and career dissatisfaction</td>
<td>18, 19, 22, 34, 43</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Chronic life stress</td>
<td>2, 14, 15, 39</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Poor eating/drinking/sleeping habits</td>
<td>5, 9, 15</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Negative social relationships and low social support</td>
<td>22, 29, 40</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td><strong>Sport-Environmental Risk Factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sport-specific stressors</td>
<td>4, 6, 9, 10, 11, 23, 26, 27, 30, 31, 37, 40</td>
<td>16</td>
<td>37</td>
</tr>
<tr>
<td>Individual and aesthetic sports’ specific features</td>
<td>2, 9, 38, 41</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td>Crisis-type retirement</td>
<td>2, 17</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Lack of support from teammates and coaches</td>
<td>17, 40</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Stigma towards help seeking</td>
<td>4, 23</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note. Percentages (%) in relation to the total number of included empirical articles (N = 43).*
## Factors affecting the mental health of elite athletes

### Appendix 1: PRISMA-ScR Checklist (Tricco et al., 2018)

<table>
<thead>
<tr>
<th>Section</th>
<th>Item</th>
<th>PRISMA-ScR Checklist Item</th>
<th>Reported on page#</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>1</td>
<td>The review title includes “scoping review”</td>
<td></td>
</tr>
<tr>
<td><strong>Abstract</strong></td>
<td>2</td>
<td>Based on the journal’s guidelines, an unstructured abstract of 200 words is provided. It includes objectives, amount of studies included, charting methods, results, and conclusions</td>
<td>1</td>
</tr>
<tr>
<td><strong>Introduction</strong></td>
<td>3</td>
<td>Although there are existing reviews on mental health in elite sport, no review has systematically screened article for protective and risk factors</td>
<td></td>
</tr>
<tr>
<td>Rationale</td>
<td>4</td>
<td>The purpose of this scoping review was threefold: (a) to provide an overview of research concerning the MH of elite athletes from 1998 to 2018, (b) to identify and categorize factors affecting elite athletes’ MH, and (c) to critically appraise the papers and detect research gaps and future challenges</td>
<td>4</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>5</td>
<td>The study has not been officially registered</td>
<td>n/a</td>
</tr>
<tr>
<td>Protocol and registration</td>
<td>6</td>
<td>Only English peer-reviewed articles were included in the present review. Due to that elite athletes’ mental health is and emerging topic, we limited the search for the last 20 years</td>
<td>6-7</td>
</tr>
<tr>
<td>Eligibility criteria</td>
<td>7</td>
<td>The search strategy was applied in the following databases: SPORTDiscus, SCOPUS, PsychINFO, EMBASE, and PubMed</td>
<td>6</td>
</tr>
<tr>
<td>Information sources</td>
<td>8</td>
<td>Key terms of the database search are explained and an example for one database (SCOPUS) is provided</td>
<td>6</td>
</tr>
<tr>
<td>Search</td>
<td>9</td>
<td>Inclusion and exclusion criteria are described in detail</td>
<td>6-7</td>
</tr>
<tr>
<td>Selection of sources of evidence</td>
<td>10</td>
<td>The two authors met on several occasions to review the initial records identified and applied the inclusion and exclusion criteria independently. The qualitative data analysis process to identify protective and risk factors is described</td>
<td>7</td>
</tr>
<tr>
<td>Data charting process</td>
<td>11</td>
<td>We looked for associations (qualitative studies) and correlates (quantitative studies) in the included articles related to athletes’ MH.</td>
<td>8 Table 2</td>
</tr>
<tr>
<td>Data items</td>
<td>12</td>
<td>Not conducted in a systematic way</td>
<td>n/a</td>
</tr>
<tr>
<td>Critical appraisal</td>
<td>13</td>
<td>Not applicable for scoping reviews</td>
<td>n/a</td>
</tr>
<tr>
<td>Summary measures</td>
<td>14</td>
<td>Results are presented both in tabular, graphical, and narrative forms</td>
<td>9 Table 2-4</td>
</tr>
<tr>
<td>Synthesis of results</td>
<td>15</td>
<td>Not applicable for scoping reviews</td>
<td>n/a</td>
</tr>
<tr>
<td>Risk of bias across studies</td>
<td>16</td>
<td>Not applicable for scoping reviews</td>
<td>n/a</td>
</tr>
<tr>
<td>Additional analyses</td>
<td>17</td>
<td>We describe the selection process including the different stages (identification, screening,</td>
<td>8</td>
</tr>
<tr>
<td>Results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection of sources of evidence</td>
<td>17</td>
<td>We describe the selection process including the different stages (identification, screening,</td>
<td>8</td>
</tr>
</tbody>
</table>

1
Factors affecting the mental health of elite athletes

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Flow chart</td>
<td>9-10</td>
</tr>
<tr>
<td>Table 2</td>
<td>Provides an overview of the 43 included articles in relation to authors, year, aims, sample, location, sport, research design, protective/risk factors, and main findings</td>
<td>9-10</td>
</tr>
<tr>
<td>Table 2</td>
<td>Provides an overview of all the correlates and associations of the individual articles that relates to the protective and risk factors (ration of the study)</td>
<td>9-13</td>
</tr>
<tr>
<td>Table 3</td>
<td>Summarizes the findings in tabular forms. Figure 2 (Conceptual map of protective and risk factors related to elite athletes’ mental health) provides a graphical overview of the results</td>
<td>9-13</td>
</tr>
<tr>
<td>Table 3</td>
<td>Summarizes the main results through the critical lens of MH propositions (MH should be better defined in sport; MH research should broaden the scope of assessment; MH as a resource for an athletic career; influence of the environment on athletes’ MH), link to the review questions and objectives, and consider the relevance researchers, coaches, and practitioners.</td>
<td>13-21</td>
</tr>
<tr>
<td>Table 4</td>
<td>Discusses some limitations of the scoping review process and the results.</td>
<td>21</td>
</tr>
<tr>
<td>Table 4</td>
<td>Provides a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.</td>
<td>23-24</td>
</tr>
<tr>
<td>Table 4</td>
<td>Describes sources of funding for the included sources of evidence, as well as sources of funding for the scoping review.</td>
<td>24</td>
</tr>
</tbody>
</table>