Consensus statement

Surveillance of athlete mental health symptoms and disorders: a supplement to the International Olympic Committee's consensus statement on injury and illness surveillance

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Abstract

In 2019, the International Olympic Committee (IOC) published a consensus statement outlining the principles for recording and reporting injury and illness in elite sport. The authors encouraged sport federations to adapt the framework to their sport-specific context. Since this publication, several sports have published extensions to the IOC consensus statement.

In response to a paucity of epidemiological data on athlete mental health, the IOC mental health working group adapted the IOC consensus statement on injury and illness surveillance to improve the capturing of athlete mental health data. In addition to the members of the working group, other experts and athlete representatives joined the project team to address gaps in expertise, and to add stakeholder perspective, respectively. Following an in-person meeting, the authors worked remotely, applying the scientific literature on athlete mental health to the IOC injury and illness surveillance framework. A virtual meeting was held to reach consensus on final recommendations.

Practical outcomes based on the analysis of the scientific literature are provided with respect to surveillance design, data collection and storage, data analysis and reporting of athlete mental health data. Mental health-specific report forms for athlete and health professional utilisation are included for both longitudinal and event-specific surveillance.

Ultimately, this publication should encourage the standardisation of surveillance methodology for mental health symptoms and disorders among athletes, which will improve consistency in study designs, thus facilitating the pooling of data and comparison across studies. The goal is to encourage systematic surveillance of athlete mental health.

Introduction

Elite athletes, like anyone in the general population, can experience sadness, anger, stress, doubt, irritability and anxiety. However, if this persists over several weeks, is causing significant distress, and/or is negatively impacting sport performance or the ability to function in daily life, then the athlete may be experiencing mental health symptoms or disorders. Mental health symptoms are defined in the International Olympic Committee (IOC) mental health consensus statement as adverse/abnormal thoughts, feelings and/or behaviours that do not occur in a pattern meeting specific diagnostic criteria (eg, Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR)[1]) and do not necessarily cause significant distress or functional impairment.[2] Conversely, mental health disorders refer to conditions causing clinically significant distress or impairment that meet specified diagnostic criteria in the DSM-5-TR.2 Mental health symptoms are common among professional, Olympic/Paralympic and collegiate athletes, with prevalence rates equivalent to or in some cases (eg, disordered eating) exceeding those of non-athletes.[3–6] The severity of these mental health symptoms can vary longitudinally during a season.[7, 8] Among elite athletes, mental health symptoms and disorders can occur as a consequence of the dynamic interaction between generic (eg, adverse life events) and sport-specific contributing factors such as international travel, decrease in sport performance, severe time-loss injury and transitioning out of sport.[2]

Thus, it is essential to initiate or strengthen efforts towards the protection of athletes' mental health. The prevalence of mental health symptoms in elite athletes warrants the use of routine surveillance to help ensure that affected or at-risk athletes are identified and provided with the level of care they require as early as possible. Elite athletes exhibit higher mental health stigma than the general population[9] and have a tendency to withhold disclosure of mental conditions[10] underscoring the need for the explicit assessment of mental health symptoms and disorders in this population. Establishing and normalising mental health surveillance as an integrated component of athletes' overall routine health assessment has the potential to reduce stigma, improve mental health literacy and help-seeking,[11] contribute to greater psychological safety[12] and generate preventative effects by identifying mental health concerns at an earlier stage when they are easier to resolve.[2, 13]

To uphold the duty to protect athletes' health, epidemiological studies identifying sport-related health concerns are fundamental. In 2020, the IOC published a consensus statement on injury and illness surveillance in sport (hereafter referred to as the 'IOC surveillance consensus statement').[14] Ensuring consistency regarding the definitions and methods used to collect and report data, this sports-generic statement was subsequently complemented by specific statements with recommendations tailored for several sports.[15–20] These sports-generic and sports-specific statements focus on the collection and reporting of data related to general physical health, especially musculoskeletal injuries, and general medical illnesses, offering detailed options to classify and code those adequately. By contrast, the taxonomy related to mental health symptoms and disorders is generic and poorly detailed; only a single illness category is presented—namely 'psychiatric/psychological'—and aetiological categories are not specific enough for mental health (eg, environmental).[14] Such a lack of specificity does not align with the many categories defined as mental health symptoms and disorders (eg,

depression, disordered eating, psychosis), nor with the various contributing factors potentially inducing these health conditions (eg, adverse life events, COVID-19 pandemic, injury).[2, 21–23] Furthermore, the injury and illness surveillance reports at the most recent Olympic Winter and Summer Games did not capture information about the different types of mental health symptoms and disorders.[24–27] This does not comport with the increasing number of elite athletes speaking about their mental health during high-profile competitions, nor with the recent epidemiological literature.[28–33] Moreover, this lack of mental health surveillance data ignores the reality that mental health symptoms and disorders—just like physical health conditions—can have substantial impact on sports performance.[2]

This discrepancy between the low level of epidemiological data and the increasing vocal testimonies of athletes might reflect traditional barriers to the reporting of mental health symptoms and disorders including stigma and low mental health literacy in athletes and their health support staff.[34, 35] However, the discrepancy might also be attributable to limitations within the IOC surveillance consensus statement, such as lack of specific mental health symptom and disorder categories.[14] Therefore, there is a need to compile a specific supplement to standardise the surveillance methodology for mental health symptoms and disorders among athletes. We encourage sport organisations to adapt the recommendations in this consensus statement to their own sporting contexts.

Methods

Following exploratory discussions about the development of a mental health supplement with the IOC surveillance consensus statement's[14] lead author, the conceptualisation and framework of the project, and the determination of the writing process occurred during an in-person meeting of the IOC Mental Health Working Group held in Lausanne, Switzerland, in April 2022. This group consists of experts from around the world representing sports psychiatry (AC, DM), sports science (RP, VG), sports medicine (CB, MM, MP), elite athletes (CB, AB) and the Director from the IOC's Medical and Scientific Department (RB). The two lead authors of the IOC consensus statement on mental health in elite sport[2] (CLR (sports psychiatry) and BH (sports medicine)) were included as co-authors to provide further expertise. To address an identified gap in knowledge and experience of surveillance epidemiology, an external expert (a psychologist who is a co-author of the IOC surveillance consensus statement[14] as well as several sport-specific adaptations) was included in the author group (AJ). To represent the IOC surveillance project that occurs at the Olympic Games, two members of the IOC Science Department were invited to participate (LE, TS). CB also represents the para sport perspective, as a member of the Medical Committee of the International Paralympic Committee. MM, AJ, AB, RB LE and TS were original authors of the IOC surveillance consensus statement,[14] and thus provided context and insight about the development of this publication.

Via videoconference, the core group of lead authors (MM, AJ and VG) defined the methodology for reaching consensus based on published guidelines.[36, 37] They identified core elements of the manuscript by defining content sections to supplement the IOC surveillance consensus paper. Subgroups with identified section leads were formed and assigned to various content sections based on expertise and interest. The subgroups were tasked to explore several electronic databases (eg, PubMed, SportDiscus, PSycINFO) for relevant scientific literature related to the specific topic area and to formulate a summary of their findings along with recommendations based on the results and expert opinion. As the topic of mental health surveillance in sport is underdeveloped, there is a paucity of publications on the topic thus precluding the feasibility of formal systematic reviews. The subgroups worked remotely

throughout the third and fourth quarters of 2022. A virtual meeting was held in December 2022 to finalise the content and recommendations. Consensus was reached by majority agreement, with all authors reviewing and approving all sections prior to submission. Dissentions were managed through group discussion and resolution.

Athlete mental health surveillance

Defining mental health terminology in sport

The IOC surveillance consensus statement[14] references a definition by Clarsen *et al*,[38] that a health problem is 'any condition that reduces an athlete's normal state of full health, irrespective of its consequences on the athlete's sports participation or performance or whether the athlete sought medical attention.' According to this definition, we defined a *mental health problem* as any adverse thought, feeling, behaviour and/or psychosomatic symptom that reduces an athlete's normal state of full mental health, irrespective of its cause or of its consequences on the athlete's sports participation or performance or whether the athlete sought medical attention. Mental health problems can range from minor mental health symptoms to severe mental health disorders.

To ensure consistency in surveillance methodology across sports and athlete populations, we have drawn on the IOC consensus statement on mental health in elite athletes as well as other resources and expert opinion to define the terms 'mental health symptoms' and 'mental health disorders' for the purposes of this manuscript. *Mental health symptoms* are defined as any adverse thought, feeling, behaviour and/or psychosomatic symptom that might lead to subjective distress or functional impairments in daily life, work and/or sport. *Mental health disorders* are syndromes characterised by clinically significant disturbance in an individual's cognition, emotional regulation or behaviour that reflects a dysfunction in the psychological, biological or developmental processes that underpin mental and behavioural functioning. These disturbances are usually associated with distress or impairment in personal, family, social, educational, occupational or other important areas of functioning, and are diagnosed according to existing clinical criteria as outlined in the DSM-5-TR.1 We consider a mental health disorder to be synonymous with a *mental illness* (see box 1).

Box 1. Definitions adopted for mental health surveillance in sport

- *Mental health problem*: any adverse thought, feeling, behaviour and/or psychosomatic symptom that reduces an athlete's normal state of full mental health, irrespective of its cause or of its consequences on the athlete's sports participation or performance or whether the athlete sought medical attention. Mental health problems cover the spectrum from minor mental health symptoms to severe mental health disorders.
- *Mental health symptoms*: any adverse thought, feeling, behaviour and/or psychosomatic symptom that might lead to subjective distress or functional impairments in daily life, work and/or sport.
- *Mental health disorders*: syndromes characterised by clinically significant disturbance in an individual's cognition, emotional regulation or behaviour that reflects a dysfunction in the psychological, biological or developmental processes that underpin mental and behavioural functioning. These disturbances are usually associated with distress or impairment in personal, family, social, educational, occupational or other important areas of functioning and are diagnosed according to existing clinical criteria such as the DSM-5-TR*.
- *Mental illness*: a mental health disorder

- *DSM5-TR: diagnostic and statistical manual of mental disorders (5th edition—text revisions)[1]

To clarify the distribution of mental health problems, symptoms and disorders by consequence of time-loss from sport, we have adapted figure 1 of the IOC surveillance consensus statement[14] in figure 1.

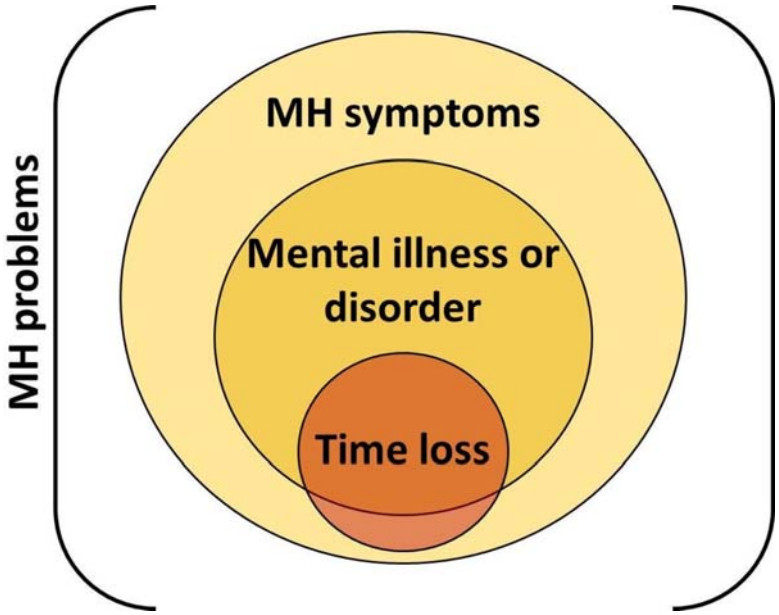

Figure 1. Relationship of mental health problems, mental health symptoms and mental illness/disorder by consequence of time-loss from sport (not drawn to scale) (adapted from Bahr *et al* [14]). MH, mental health.

Classifying mental health diagnoses in athletes

The IOC surveillance consensus statement[14] identifies the limitations of the International Classification of Diseases (ICD-11)[39] with respect to sports-related classifications and recommends the use of one of the revised sport-specific classification systems (Orchard Sport Classification of Injury and Illness System (OSCIIS) or the Calgary Sport Medicine Diagnostic Coding System)[40]; however, there are not classifications for many of the common mental health presentations in athletes in these systems. Traditionally, mental health disorders are classified by the DSM-5-TR.[1] Table 1 illustrates the comparison between the ICD-11,[39] DSM-5-TR1,OSCIIS[40], and SMDCS classification systems as they pertain to some common mental health disorders in athletes, as well as a description and their symptom clusters (as per Tables 5 and 9 in the IOC surveillance consensus statement[14]).

Recording athletes' mental health symptoms

As outlined in the IOC surveillance consensus statement,[14] athletes and non-clinical recorders should report only symptoms, whereas health professionals can record diagnoses. For athletes' health surveillance, usually either a sport health professional or the athlete themself will be reporting the athlete's mental health symptom(s). To facilitate consistency between studies and the comparison of athlete populations, we developed a list of common mental health symptoms or symptom clusters for utilisation by health professionals and athlete/non-clinical individuals based on DSM-5-TR defined symptoms and other validated tools (eg, Patient Health Questionnaire (PHQ)-2 (depression),[41] Generalized Anxiety Disorder)-2 (anxiety)[42]) (see Table 2).

Table 1. Description, symptom cluster, ICD-11 codes, DSM-5-TR terminology, OSIICS 14, and SMDCS codes for the classification of mental health disorders prevalent in athletes1 39 40 51

MH disorders	Description	Symptom cluster	ICD-11	DSM-5-TR	OSIICS 14	SMDCS
Depressive disorders	Low mood, irritability, loss of interest or pleasure, accompanied by cognitive, behavioural or neurovegetative symptoms that cause distress or significantly affect one's ability to function	Low mood, irritability, loss of pleasure, lack of energy or motivation, sleep disturbances, concentration problems, loss of appetite or overeating, rumination, indecision, low self-esteem, guilt, suicidal thoughts or intention	6A70 single episode 6A71 recurrent depression	Depressive disorders	MSXD	PS.01.81
Anxiety disorders	Persistent symptoms of anxiety manifested by general apprehension or excessive worry focused on multiple everyday events, resulting in significant impairment in personal, family, social, educational, occupational function	General apprehension, excessive worry, restlessness, arousal, difficulty concentrating, irritability, sleep difficulties, easily fatigued	6B00	Anxiety disorders	MSSA	PS.01.81
Specific phobias	Marked or excessive fear or anxiety that consistently occurs on exposure, or anticipation of exposure, to one or more specific objects or situations and that is out of proportion to the actual danger	Overwhelming fear of an object or situation, (eg, heights, flying, closed spaces, spiders), anxiety, feelings of dread, fear of losing control, panic, avoidance behaviour	6B03	Specific phobia	Not categorised	PS.01.83
Panic disorder	A discrete episode of intense fear including multiple acute psychological and/or psychosomatic symptoms	Excessive fear, anxiety, sweating, trembling, hot flushes, chills, shortness of breath, choking sensation, rapid heartbeat, chest pain, dizziness	6B01	Panic disorder	MSSA	PS.01.83
Somatisation	Persistent and significant focus on general physical symptoms, such as pain, weakness, shortness of breath, to a level that results in distress or difficulties functioning. Often associated with excessive thoughts, feelings and behaviours related to the physical symptoms	Unexplained pain, nervous stomach, heart palpations, physical reactions to psychological stress, weakness, shortness of breath, excessive thoughts, feelings or behaviours related to the physical symptoms	6C20.Z somatic symptom disorder	Bodily distress disorders	Not categorised	PS.05.83

Eating disorders	Abnormal eating behaviours often with associated preoccupation with food, body weight or shape concerns	Abnormal eating behaviours including restricting food intake, self-induced emesis, use of laxatives or diuretics, excessive exercise preoccupation with, and/or distorted body image, alterations in weight, preoccupation with nutritional content, menstrual disturbances	6B80 anorexia nervosa 6B81 bulimia disorder 6B82 binge eating disorder	Feeding and eating disorders	MSNA anorexia nervosa MSNB bulimia nervosa	PS.01.77
Sleep disorders	Persistent inability to initiate or maintain sleep. Resulting failure to obtain sufficient sleep to meet their own physiological sleep requirements to maintain normal levels of alertness and wakefulness	Inability to initiate or maintain sleep, waking up too early, daytime fatigue, strong urges to nap in the daytime, unusual movements while falling asleep, irregular breathing	7A26 insufficient sleep syndrome	Sleep–wake disorders	Not categorised	PS.03.83
Gambling or betting disorder	Persistent and episodic or recurrent problematic gambling behaviour leading to significant impairment or distress	Gambling to escape worries, playing longer, depression, obsessive thoughts about gambling, financial problems, anxiety	QE21 hazardous gambling or betting 6C50 gambling disorder	Gambling disorder	MSZG	PS.07.83
Obsessive–compulsive disorders	Persistent obsessions and/or compulsions such as repetitive thoughts, images, impulses/urges that are intrusive, unwanted, and commonly associated with anxiety Obsessions are often neutralised by performing compulsions	Repetitive obsessive thoughts, rumination, unwanted thoughts, anxiety, repetitive, excessive compulsive behaviours performed to resolve the anxiety, perfectionism	6B20	Obsessive–compulsive disorders	MSSA	PS.08.83
Bipolar disorders	Bipolar 1 requires at least one episode of mania (at least 1 week of symptoms). In Bipolar 2 there will only be episodes of hypomania (symptoms for at least 4 days) but in addition a current or prior episode of major depression is required to make a diagnosis	Persistent symptoms of mania include elevated, expansive, irritable mood, excessive energy, decreased need for sleep, distractibility, unusual talkativeness, psychomotor agitation, impulsivity or risk-taking (for depression—see above)	6A60	Bipolar disorders	Not categorised	PS.09.83

Alcohol and other substance misuse	A maladaptive pattern of substance use leading to significant impairment or distress	Changes in personality and behaviour, and depending on the substance used a current state of intoxication/ withdrawal, lack of motivation, irritability, agitation, shakes, tremors, slurred speech, poor personal hygiene, financial problems, bloodshot eyes, bloody nose	6C4Z disorders due to substance use, unspecified 6C40.2Z alcoholism	Substance-related and addictive disorders	MSDA	PS.01.81
Attention deficit hyperactivity disorder	A neurodevelopmental disorder that is characterised by a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with function	Inattention, difficulties with organisation, easily distracted, forgetful, hyperactive, impulsive, excessive talking. Occurring in two or more settings and interfering with, or reduces the quality of social, school or work (including sport) function	6A05	Attention deficit hyperactivity disorder (inattentive or hyperactive/impulsive types)	Not categorised	PS.01.80

DSM-5-TR, diagnostic and statistical manual of mental disorders (5th edition-text revision); ICD-11, International Classification of Diseases-11; MH, mental health; OSIICS, Orchard sport injury and illness classification system; SMDCS, Sport Medicine Diagnostic Coding System

Table 2. Symptoms or symptom clusters to be recorded in athletes' mental health surveillance

Health professionals	Athlete, or non-clinical recorder
Depression	Feeling down, depressed or hopeless41
	Little interest or pleasure in doing things41
Generalised anxiety	Feeling anxious, nervous or on edge42
	Not able to stop or control worries42
Phobia (eg, heights, flying, spiders)	Phobia, that is, excessive fear of an object or situation (eg, heights, flying, spiders)
Performance anxiety	Performance anxiety
Panic attacks	Panic attacks
Hyperactivity/agitation	Hyperactivity/agitation
Difficulties concentrating	Difficulties concentrating
Eating problems	Eating problems
Sleeping problems	Sleeping problems
Psychosomatic problems (eg, unexplained pain, heart palpitations)	Psychosomatic problems (eg, unexplained pain, heart palpitations)
Obsessive–compulsive behaviours	Urge to perform repetitive behaviours (eg, cleaning, washing hands, checking, counting)
Excessive gaming behaviours	Excessive gaming behaviours
Gambling, betting	Gambling, betting
Alcohol or drug misuse	Alcohol or drug misuse
Elation or euphoria for no reason and excessive energy	Elation or euphoria for no reason and increased energy
Mood swings, other than bipolar disorder	Mood swings without extreme euphoria/elation
Irritability, anger or tension with people	Irritability, anger or tension with people
Aggressive behaviour against other people or objects (verbal or physical)	Aggressive behaviour against other people or objects (verbal or physical)
Social withdrawal	Social withdrawal
Thoughts or actions of non-suicidal self-harm	Thoughts or actions of non-suicidal self-harm (eg, cutting, or severe scratching)
Suicidal thoughts, intentions or actions	Suicidal thoughts, intentions or actions
Other, please specify	Other, please specify

Classifying mode of onset

The IOC surveillance consensus statement authors identify that the mode of onset for injury and illness can have a mix of both acute and gradual onsets, with a variety of underlying mechanisms (see Table 1 in IOC surveillance consensus statement[14]). Similarly, the onset of a mental health problem can be sudden, gradual or mixed (see Table 3).

Table 3. Examples of mental health modes of onset

Presentation	Example
Sudden onset	A sprinter presents with an acute panic attack related to performance anxiety at his first international competition.
Gradual onset	A rugby player presents with a 6-month history of gradually worsening disruptive behaviours and inconsistent sport performance related to increasing alcohol misuse.
Mixed mode of onset	A swimmer presents with acute suicidal ideation with an underlying 1-year history of depression.
Unknown	A figure skater cannot remember how her eating disorder started.

Adapted from Table 1 IOC surveillance consensus statement by Bahr *et al*.14

IOC, International Olympic Committee.

Recording aetiology

The IOC surveillance consensus statement[14] emphasises the importance of recording the aetiology or mechanism of the index injury (see Table 2 of IOC surveillance consensus statement[14]) or illness (see Table 8 of the IOC surveillance consensus statement[14]). Identifying the underpinning contributing factor(s) or reason(s) for the health problem is the second step in the injury prevention sequence originally outlined by van Mechelen.[43] Mental health symptoms and disorders are believed to be the ultimate result of a multitude of biopsychosocial factors. From a surveillance perspective, it is helpful to identify, if feasible, the most influential factor(s) for the mental health problem, for the purposes of developing targeted risk modification interventions. Table 4 is a collection of potential contributing factors for the athlete mental health problem for use by either athlete or health professional recording.

Table 4. Most influential contributing factor(s) or reason(s) for the index athlete mental health problem (multiple answers can apply)

- Musculoskeletal injury
- Concussion or other traumatic brain injury
- Chronic pain
- Medical illness (eg, cancer, infection, thyroid dysfunction)
- Life outside of sport (eg, problems in family/partnership, loss of a close person, finances)
- Sport performance (eg, perceived failure, pressure)
- Body weight, body shape or body image
- Gender dysphoria
- Behaviour of teammates, coach, management, etc. (eg, rivalry, bullying, harassment)
- Dissatisfaction with sport career (eg, stagnant development, poor sport-life-balance)
- Other aspects of the sport environment (eg, injury risk)
- Social media or other media comments (eg, harassment, bullying)
- Alcohol or drug use
- Side effect of medication
- Transitioning, or retiring from sport
- Other, please specify
- Unknown

Measuring severity

The IOC surveillance consensus statement[14] states that the severity of health problems in sport can be described using various criteria, based on the duration of complaints, of limitations in performance or of time-loss from sport participation. In contrast to special grading systems developed for some diagnoses (eg, depression), measuring severity by duration facilitates comparison across different health problems.

The IOC Sport Mental Health Assessment Tool-1 (SMHAT-1) measures severity of general psychological distress and of specific symptoms using the cut-off thresholds of the included questionnaires.[34] The Oslo Sport Trauma Research Centre Questionnaire on Health Problems (OSTRC-H2, for details see below) calculates the severity of health problems based on the answers to four questions.[38]

Multiple health problems

Throughout a season, an athlete can encounter more than one health problem. Consistent with the concepts presented in the IOC surveillance consensus statement[14] on multiple events, we have adapted figure 2 to include mental health problems.

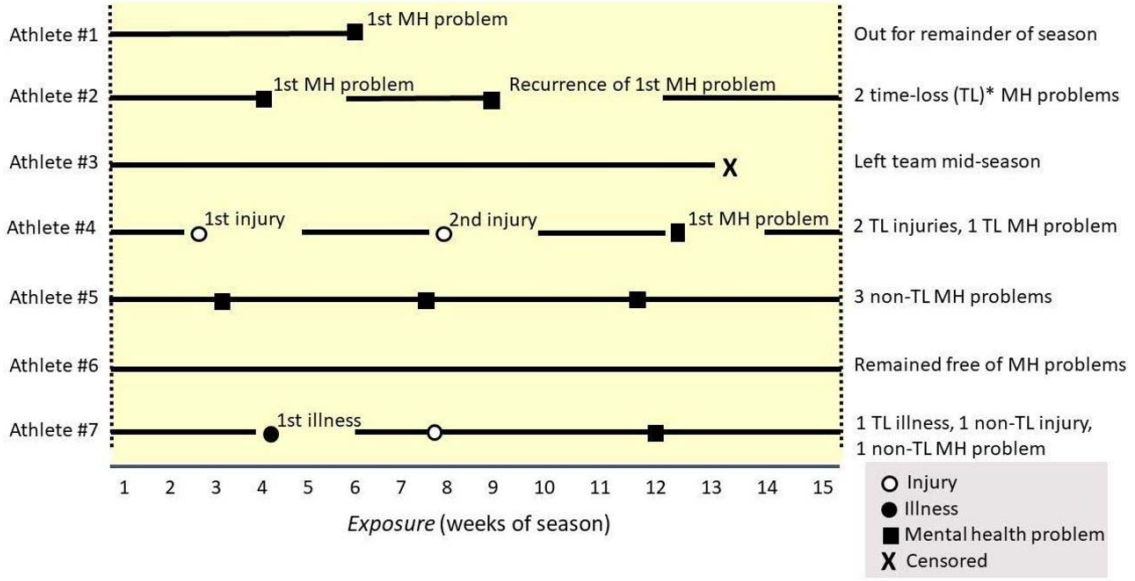

Figure 2. Recording of multiple health problems: examples of hypothetical prospectively collected injury/illness/mental illness data (adapted from Bahr *et al* [14]). MH, mental health.

Subsequent, recurrent and/or exacerbation of mental health problems

The IOC mental health surveillance writing group also concurs that the injury and illness classification of subsequent, recurrent and/or exacerbation concepts are applicable to the mental health context for the purposes of surveillance. Modifications to figure 3 of the IOC surveillance consensus statement[14] have been adapted to demonstrate mental health presentations.

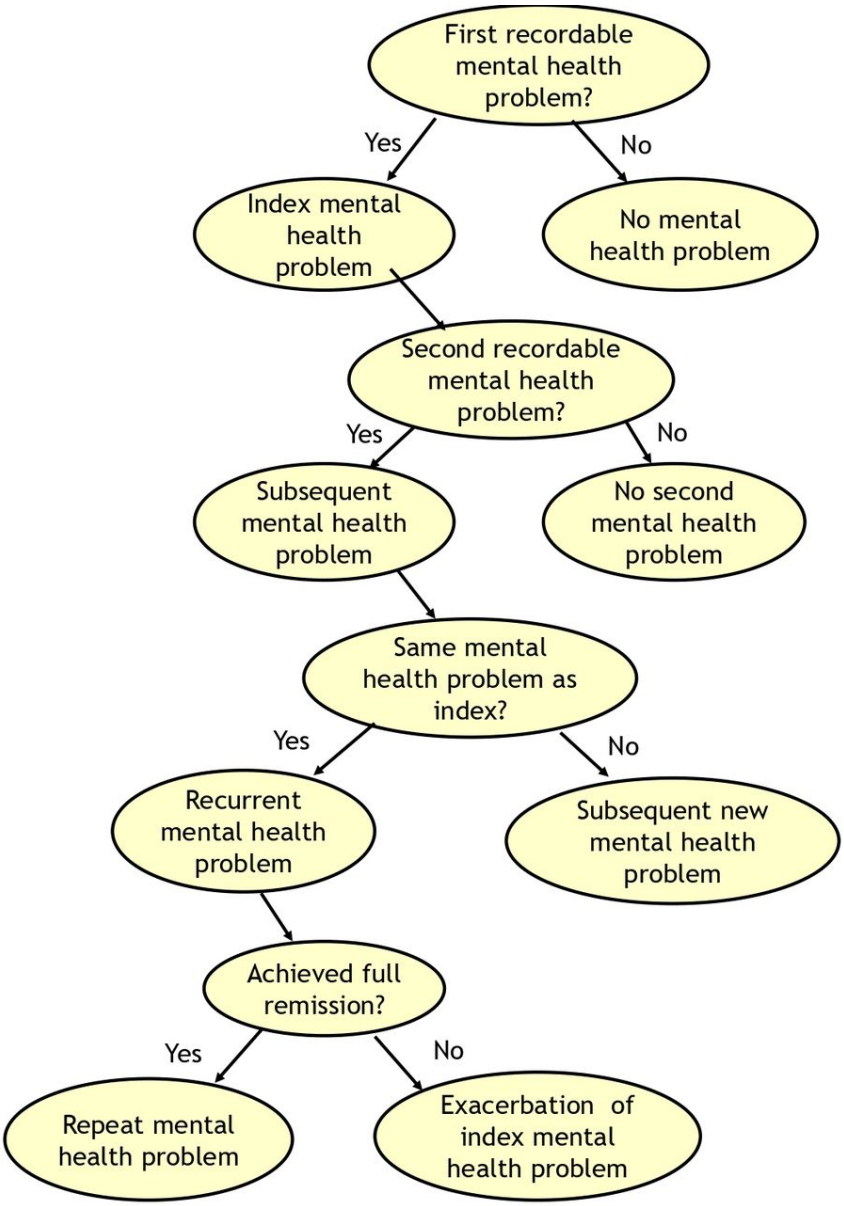

Figure 3. Classification tree for subsequent mental health problems (adapted from Bahr *et al* [14]). Definitions: (1) index mental health problem=the first recorded mental health problem (2) subsequent mental health problem=any mental health problem occurring after the index mental health problem. (i) Subsequent mental health problem that is different than index mental health problem=new subsequent mental health problem or (ii) subsequent recurrent mental health problem that is the same as the index mental health problem. If not achieved remission*=exacerbation of index mental health problem. If achieved remission=repeat index mental health problem. *Remission is defined by DSM-5 as being without symptoms for 2 months (depression) or 3–12 months (addiction). DSM, diagnostic and statistical manual of mental disorders.

Reporting exposure, expressing risk, burden of health problems, study population characteristics, data collection methods and reporting guidelines

We recommend the implementation of the principles outlined in the IOC surveillance consensus statement[14] for these various aspects of surveillance with no modifications relevant to mental health surveillance.

Practical applications

When should athlete mental health surveillance be conducted?

In addition to the research applications of the proposed mental health surveillance recommendations, these tools can also be used to monitor athlete mental health symptoms clinically. Thus, ideally, for clinical applications, mental health surveillance should be conducted prospectively and systematically throughout the entire season including competitive and off-season periods. If prospective surveillance is not possible, then episodic mental health screening can occur around key timepoints, for example, during periodic health examinations (eg, pre-season, mid-season or post-season)[8] or on occasions of significant injury, illness or mental health problem. Surveillance can also occur in response to a specific trigger for developing mental health symptoms or disorders from either (1) inside sport (eg, being cut from a team, after international competition, retiring from sport),[44] or from (2) personal stressors from outside of sport. Mental health surveillance should also occur during large competitions or tournaments such as World Championships organised by International Sport Federations, or multi-sport events such as the Olympic and Paralympic Games, Commonwealth Games or Continental Championships (eg, Pan American, or Asian Games) when mental health symptoms such as anxiety and sleep disorders might be heightened.[28] Athletes and coaches may consider mental health surveillance during competitive events as intrusive and/or unnecessary; thus, surveillance conducted during events must take into account this sensitivity.

Who should conduct athlete mental health surveillance?

Depending on the research question or the objective of the mental health surveillance, either the athlete or a health professional can record the data. For mental health surveillance that is designed to be reported by a health professional, we recommend that the individual is a qualified member of the athlete health entourage who has developed a trusting, professional relationship with the athlete such as the sports medicine physician, sports psychiatrist and/or licensed sport psychologist.[45,46] These individuals should have the training, skills, ethical responsibility and experience to manage mental health problems in the sports context. Requiring these individuals to also have trauma-informed skills is recommended to assist with the diagnosis and support of athletes who are identified in the surveillance process as having mental health problem secondary to harassment and abuse (trauma) from within or outside of sport.[47] If sport event-related mental health surveillance is being conducted in a single or multi-sport context where the investigators do not have a therapeutic relationship with the athlete, it is important that mental health support be available for any mental health concerns identified during the surveillance process. [45, 46]

How should mental health surveillance be conducted?

It is important that athlete mental health information be treated with confidentiality and data security protection as other medical information. However, as MH data are perceived as more sensitive in nature and given the stigma around mental health that exists in sport, mental health information may require higher levels of protection to safeguard an athlete's privacy, particularly in high profile, elite sport settings. Strict confidentiality is particularly important for sensitive information related to substance misuse and harassment and abuse. Individual mental health data should not be accessible to anyone outside of the defined circle of care (ie, those designated healthcare professionals responsible for this aspect of the athletes' health),

who are bound by professional codes of conduct with respect to confidentiality.[48] If felt appropriate within a given setting, access to athlete mental health data can be coordinated within the electronic medical record or surveillance database by having either a separate section for mental health symptoms and disorders that can be viewed only by designated individuals, or by having limitations to access for specific files and/or notes.

When working with athlete mental health, it is particularly important to recognise the duty of care to support and treat athletes who are identified as having mental health symptoms or disorders during the surveillance process. As such, sport health professionals conducting surveillance should be equipped with the clinical competence to recognise, diagnose, treat and/or refer for common mental health presentations in the sports context.[2]

Tools to conduct mental health surveillance

There are several tools that can be used to perform mental health surveillance in sport. The selection of a specific tool depends on the aim of the project, the study design (ie, how, who, where, when, frequency, etc.), the available resources and other parameters. Please see Table 5 for a summary of the various mental health surveillance tools and the roles of athletes and the athlete healthcare team. Translation of the tools into other languages to improve end-user comprehension is recommended. We highly recommend using validated tools and questionnaires.

Table 5. A summary of the types of mental health surveillance tools, timing of data collection for each type, the recommended tools within each type, and the roles of the athlete and the health professional

Type of surveillance	Timing of data collection	Tool	Athlete role	Sports medicine/sports psychiatry/sports psychology role
Screening	At specific or episodic time points (eg, pre-season, post major event, significant injury)	SMHAT-1	Data entry: completion of questionnaire(s)	To analyse and respond to athlete reporting
Longitudinal athlete-based surveillance	At regular pre-determined time intervals throughout the season (eg, weekly, bi-weekly, monthly)	Modified OSTRC-H38 (Appendix 1)	Data entry: completion of questionnaire	To analyse and respond to athlete reporting
Longitudinal surveillance by a health professional	Throughout the entire season as MH problem(s) occur	Modified IOC Season Surveillance Tool14 (Appendix 2)	Reporting of MH symptoms to the entourage healthcare provider	Data entry: to record cases that receive medical attention To analyse and respond to athlete reporting
Sport event-related surveillance	At regular pre-determined time intervals during sporting events (eg, daily reporting during Olympic Games, Tournaments, World Championships)	Modified IOC (Multi-) Sport Event Surveillance Tool14 (Appendix 3)	Reporting of MH symptoms to the entourage healthcare provider	Data entry: to record the cases that receive medical attention To analyse and respond to athlete reporting

IOC, International Olympic Committee; MH, mental health; OSTRC-H, Oslo Sport Trauma Research Center-Health; SMHAT-1, Sport Mental Health Assessment Tool-1.

For *athlete-based longitudinal monitoring* of health problems, the OSTRC-O was recently enhanced to capture any health problem including injury, illness, pain and mental health conditions (OSTRC-H2).[38] This questionnaire uses four questions to assess the impact of these problems on key sports-specific functional outcomes: (1) sport participation, (2) modifications

to training and competition, (3) sport performance and (4) symptom severity. The authors state that additional questions must be used to classify health problems and provide additional information to researchers or clinicians but did not make any recommendations on these follow-up questions.[38] A list of 13 mental health complaints in addition to the original version of this tool was used in a study on dance students and dance-teacher students.[49] Of this list, we exclude six, as they are non-specific, reworded four, kept three and added 16. Thus, we have developed a list of 23 symptoms or symptom cluster that should be provided to athletes (see Table 2). In addition, we recommend asking further questions about the date of onset, whether the problem is new, a recurrence or worsening, the subjective reason or most influential factor(s) (see Table 3), the use of professional help and the duration of the problem. Our recommendation of an athlete-based report form for longitudinal monitoring of (mental) health problems is presented in Supplemental Appendix 1.

For *longitudinal monitoring of health problems by a physician or the medical team,* we have modified the IOC report form for during the season[14] (see Supplemental Appendix 2). We have also added a mental health section to the IOC report form for (multi-)*sport events-related monitoring of health problems by a physician or the medical team* (see Supplemental Appendix 3). Due to their distinctiveness and importance, we recommend a specific, separate section for mental health data. Following the structure of the injury and illness sections of the IOC health surveillance form, we propose the documentation of (a) mental health symptoms/symptom clusters (Table 2), (b) the most influential contributing factor(s) or reason(s) for the mental health problems (Table 4), (c) mode of onset (Table 3), (d) new, recurrent or exacerbation, (e) duration of time-loss in sport and (f) date of return to sport or reason for not returning to sport (with the new inclusion of retirement).

For *episodic screening of athlete mental health,* the IOC's Sports Mental Health Assessment Tool 1 (SMHAT-1)[34] is recommended. First, all athletes complete Step 1, which contains a validated screening tool for sport-related psychological distress. Then those who score above threshold complete Step 2, which contains the validated screening tools for depression, anxiety, sleep disturbance, alcohol, drug misuse and eating disorders. In the case of diagnostic uncertainty, complexity, severity or treatment non-responsiveness, athletes can complete further validated screening measures (Step 3b) designed to screen for attention-deficit/hyperactivity disorder, bipolar disorder, post-traumatic stress disorder, problem gambling and psychosis.[34]

Discussion and summary of consensus recommendations

Mental health is an integral component of both athlete health and sport performance. This publication on mental health surveillance serves as a supplement to the IOC surveillance consensus statement[14] by including and standardising surveillance principles specific to athlete mental health. Conducting systematic and methodologically robust mental health surveillance is key to identifying and defining mental health problems in athletes and is a critical component of the prevention and early intervention cycle. Mental health literacy education of athletes and the entourage is recommended to realise successful mental health surveillance. Implementation of the athlete mental health surveillance recommendations from this publication will also serve to improve the quality of surveillance research outcomes and facilitate comparison of results across studies. In addition, adoption of the principles outlined in this publication should improve clinical outcomes by facilitating earlier identification of athlete mental health problems.

There are some limitations to this publication. Author membership on this manuscript does not include individuals from Africa or South America. In addition, a systematic review of the scientific literature was not undertaken due to the paucity of published scientific literature on the topic. We also acknowledge that the proposed additions to the surveillance forms have not yet been implemented in their current form (other than the SMHAT-1) and require piloting to assess feasibility and efficacy. As with all injury and illness surveillance studies, there may be inconsistencies of inter- and intra-athlete reporting, as well as unknown correlation between reporting athletes, and medical providers.

A summary of the main additions to, and adaptions of, the IOC surveillance consensus statement[14] related to the surveillance of athlete mental health can be found in Table 6.

Table 6. A summary of the main additions to the IOC surveillance consensus statement on injury and illness surveillance related to the surveillance of athlete mental health

Topic	Additions and amendments
Defining mental health terminology	Mental health problems, symptoms, disorders, illness (Box 1)
Classifying mental health diagnoses	Identification of mental health-specific ICD-1139, DSM 5-TR1, OSIICS 14, and SMDCS classifications (table 1)
Symptoms and symptom clusters	Inclusion of mental health-specific symptoms and symptom clusters for health professionals and athlete/ non-health professional recorders (table 2)
Aetiology of mental health problems	Development of options for the recording of potential reason or most influential contributing factor(s) of mental health problems (table 4)
Mode of onset	Adaptation of examples for modes of onset for mental health problems (table 3)
Multiple mental health problems	Adaptation of IOC surveillance consensus statement14 figure 2 for relevance for mental health problems
Subsequent, recurrent, and/or exacerbation of mental health problems	Adaptation of IOC surveillance consensus statement14 figure 3 for relevance for mental health problems
Measuring severity	In addition to the IOC surveillance consensus statement,14 cut-off thresholds of the questionnaires included in the IOC SMHAT-134
Mental health data collection and storage	Inclusion of recommendations for safe and ethical methods for obtaining mental health surveillance data and data security
Availability of mental health support	Recommendation for mental health support to be available for any mental health concerns identified during the surveillance process
Mental health surveillance tools	Additions of a specific section on mental health problems to the IOC surveillance consensus statement14 sports event and season surveillance tools (online supplemental appendices 2 and 3)
	Addition of questions on mental health symptoms, reasons and contributing factors to facilitate prospective athlete-based mental health reporting using the OSTRC-H238 (online supplemental file 1)
	Inclusion of the IOC SMHAT-134 as a tool for episodic screening of athlete mental health

DSM-5-TR, diagnostic and statistical manual of mental disorders (5th edition-text revision); ICD-11, International Classification of Diseases-11; IOC, International Olympic Committee; OSTRC-H2, Oslo Sport Trauma Research Center-Health; SMHAT-1, Sport Mental Health Assessment Tool-1.

Conclusions

Sport has the duty of care to protect the health of athletes.[50] We encourage the implementation of the surveillance principles outlined in this paper, and the adaptation of them to a variety of sporting contexts, including the Olympic Games. Adoption of the recommendations outlined

above should not only stimulate mental health surveillance and promote mental health literacy,[11] but also may decrease stigma, and improve the quality of mental health surveillance outcomes. The goal of mental health surveillance is to improve athlete health and well-being. 'Mental health and other aspects of physical health are two halves of a whole, and care for both must be seen as a priority.' AB, Olympic Champion and member of the IOC Mental Health Working Group.[45]

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Competing interests MM is a Deputy Editor of the BJSM and a member of the BJSM IPHP Editorial Board. VG is Chair of the IOC Mental Health Working Group and MM, AB, CB, AC, DM, RP and MP are members. CLR and BH are co-Chairs of the IOC Consensus Group on Mental Health in Elite Athletes. RB is the IOC Medical and Scientific Director. LE is the IOC Head of Science Activities. TS is the IOC Scientific Manager. CB is an Associate Editor of the BJSM and a member of the BJSM IPHP Editorial Board. She is a member of the IOC Medical & Scientific Commission and the IPC Medical Committee. LE is an IPHP Editor of the BJSM.

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References

1. American Psychiatric Association. Diagnostic and statistical Manual of mental disorders. In: Diagnostic and Statistical Manual of Mental Disorders. 5th ed., text rev. American Psychiatric Association, 18 March 2022.
2. Reardon CL, Hainline B, Aron CM, et al. Mental health in elite athletes: International Olympic committee consensus statement (2019). Br J Sports Med 2019;53:667–99.
3. Golding L, Gillingham RG, Perera NKP. The prevalence of depressive symptoms in high-performance athletes: a systematic review. Phys Sportsmed 2020;48:247–58.
4. Gorczynski PF, Coyle M, Gibson K. Depressive symptoms in high-performance athletes and non-athletes: a comparative meta-analysis. Br J Sports Med 2017;51:1348–54.
5. Gouttebarge V, Castaldelli-Maia JM, Gorczynski P, et al. Occurrence of mental health symptoms and disorders in current and former elite athletes: a systematic review and meta-analysis. Br J Sports Med 2019;53:700–6.
6. Swartz L, Hunt X, Bantjes J, et al. Mental health symptoms and disorders in Paralympic athletes: a narrative review. Br J Sports Med 2019;53:737–40.

7. Hammond T, Gialloreto C, Kubas H, et al. The prevalence of failure-based depression among elite athletes. Clin J Sport Med 2013;23:273–7.
8. Mountjoy M, Edwards C, Cheung CP, et al. Implementation of the IOC sport mental health assessment tool 1: screening for mental health symptoms in a Canadian multi-sport University program. Clinical Journal of Sport Medicine 2023;33:5–12.
9. Gulliver A, Griffiths KM, Christensen H. Barriers and Facilitators to mental health help-seeking for young elite athletes: a qualitative study. BMC Psychiatry 2012;12:157.
10. Breslin G, Shannon S, Haughey T, et al. A systematic review of interventions to increase awareness of mental health and well-being in athletes, coaches and officials. Syst Rev 2017;6:177:177.:.
11. Castaldelli-Maia JM, Gallinaro JG de ME, Falcão RS, et al. Mental health symptoms and disorders in elite athletes: a systematic review on cultural Influencers and barriers to athletes seeking treatment. Br J Sports Med 2019;53:707–21.
12. Rice S, Walton CC, Pilkington V, et al. Psychological safety in elite sport settings: a Psychometric study of the sport psychological safety inventory. BMJ Open Sport Exerc Med 2022;8:e001251.
13. McDuff DR, Morse ED, White RK. Professional and collegiate team assistance programs: services and utilization patterns. Clin Sports Med 2005;24:943–58,
14. Bahr R, Clarsen B, Derman W, et al. International Olympic committee consensus statement: methods for recording and reporting of Epidemiological data on injury and illness in sport 2020 (including STROBE extension for sport injury and illness surveillance (STROBE-SIIS)). Br J Sports Med 2020;54:372–89.
15. Verhagen E, Clarsen B, Capel-Davies J, et al. Tennis-specific extension of the International Olympic committee consensus statement: methods for recording and reporting of Epidemiological data on injury and illness in sport 2020. Br J Sports Med 2021;55:9–13.
16. Clarsen B, Pluim BM, Moreno-Pérez V, et al. Methods for Epidemiological studies in competitive Cycling: an extension of the IOC consensus statement on methods for recording and reporting of Epidemiological data on injury and illness in sport 2020. Br J Sports Med 2021;55:1262–9.
17. Murray A, Junge A, Robinson PG, et al. International consensus statement: methods for recording and reporting of Epidemiological data on injuries and illnesses in golf. Br J Sports Med 2020;54:1136–41.
18. Derman W, Badenhorst M, Blauwet C, et al. Para sport translation of the IOC consensus on recording and reporting of data for injury and illness in sport. Br J Sports Med 2021;55:1068–76.
19. Greenspan S, Munro D, Nicholas J, et al. Circus-specific extension of the International Olympic committee 2020 consensus statement: methods for recording and reporting of Epidemiological data on injury and illness in sport. BMJ Open Sport Exerc Med 2022;8:e001394.
20. Waldén M, Mountjoy M, McCall A, et al. Football-specific extension of the IOC consensus statement: methods for recording and reporting of Epidemiological data on injury and illness in sport 2020. Br J Sports Med 2023;57:1341–50.
21. Gouttebarge V, Bindra A, Drezner J, et al. Minds matter: how COVID-19 highlighted a growing need to protect and promote athlete mental health. Br J Sports Med 2022;56:953–5.
22. Lambert C, Schuetz L-M, Rice S, et al. Depressive symptoms among Olympic athletes during the COVID-19 pandemic. BMC Sports Sci Med Rehabil 2022;14:36.
23. Putukian M. The psychological response to injury in student athletes: a narrative review with a focus on mental health. Br J Sports Med 2016;50:145–8.

24. Soligard T, Steffen K, Palmer-Green D, et al. Sports injuries and illnesses in the Sochi 2014 Olympic winter games. Br J Sports Med 2015;49:441–7.
25. Soligard T, Steffen K, Palmer D, et al. Sports injury and illness incidence in the Rio de Janeiro 2016 Olympic summer games: A prospective study of 11274 athletes from 207 countries. Br J Sports Med 2017;51:1265–71.
26. Soligard T, Palmer D, Steffen K, et al. Sports injury and illness incidence in the Pyeongchang 2018 Olympic winter games: a prospective study of 2914 athletes from 92 countries. Br J Sports Med 2019;53:1085–92.
27. Soligard T, Palmer D, Steffen K, et al. New sports, COVID-19 and the heat: sports injuries and illnesses in the Tokyo 2020 summer Olympics. Br J Sports Med 2023;57:46–54.
28. Mountjoy M, Junge A, Magnusson C, et al. Beneath the surface: mental health and Harassment and abuse of athletes participating in the FINA (Aquatics) world championships, 2019. Clin J Sport Med 2022;32:95–102.
29. Åkesdotter C, Kenttä G, Eloranta S, et al. The prevalence of mental health problems in elite athletes. J Sci Med Sport 2020;23:329–35.
30. Poucher ZA, Tamminen KA, Sabiston CM, et al. A longitudinal examination of changes in mental health among elite Canadian athletes. J Sports Sci 2022;40:733–41.
31. Poucher ZA, Tamminen KA, Sabiston CM, et al. Prevalence of symptoms of common mental disorders among elite Canadian athletes. Psychology of Sport and Exercise 2021;57:102018.
32. Neumann DL, Piatkowski TM, Moffitt RL, et al. The mental health of elite athletes in developing nations of the greater Oceania region. Australian Psychologist 2023;58:94–104.
33. Foskett RL, Longstaff F. The mental health of elite athletes in the United Kingdom. J Sci Med Sport 2018;21:S1440-2440(17)31821-2:765–70.:.
34. Gouttebarge V, Bindra A, Blauwet C, et al. International Olympic Committee (IOC) sport mental health assessment tool 1 (SMHAT-1) and sport mental health recognition tool 1 (SMHRT-1): towards better support of athletes' mental health. Br J Sports Med 2021;55:30–7.
35. Bauman NJ. The stigma of mental health in athletes: are mental toughness and mental health seen as contradictory in elite sport Br J Sports Med 2016;50:135–6.
36. Shrier I. Consensus statements that fail to recognise dissent are flawed by design: a narrative review with 10 suggested improvements. Br J Sports Med 2021;55:545–9.
37. Blazey P, Crossley KM, Ardern CL, et al. It is time for consensus on 'consensus statements Br J Sports Med 2022;56:306–7.
38. Clarsen B, Bahr R, Myklebust G, et al. Improved reporting of Overuse injuries and health problems in sport: an update of the Oslo sport trauma research center questionnaires. Br J Sports Med 2020;54:390–6.
39. World Health Organization. International classification of Diseases-11 for mortality and morbidity Statistics. Available: https://icd.who.int/en2022 [Accessed 19 Sep 2022].
40. Orchard JW, Meeuwisse W, Derman W, et al. Sport medicine diagnostic coding system (SMDCS) and the orchard sports injury and illness classification system (OSIICS): revised 2020 consensus versions. Br J Sports Med 2020;54:397–401.
41. Levis B, Sun Y, He C, et al. Accuracy of the PHQ-2 alone and in combination with the PHQ- 9 for screening to detect major depression: systematic review and meta-analysis. JAMA 2020;323:2290–300.
42. Plummer F, Manea L, Trepel D, et al. Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic Metaanalysis. Gen Hosp Psychiatry 2016;39:24–31.

43. van Mechelen W, Hlobil H, Kemper HC. Incidence, severity, Aetiology and prevention of sports injuries. A review of concepts. Sports Med 1992;14:82–99.
44. Lavallee D, Gordon S, Grove JR. Retirement from sport and the loss of athletic identity. Journal of Personal and Interpersonal Loss 1997;2:129–47.
45. The IOC Mental health in elite athletes toolkit. International Olympic committee. 2021. Available: https://stillmed.olympics.com/media/Document%20Library/IOC/Athletes/Safe-Sport-Initiatives/IOC-Mental-Health-In-Elite-Athletes-Toolkit-2021.pdf [Accessed 19 2022].
46. National Collegiate Athletic Association (NCAA). Mental health. NCAA Sport Science Institute. Available: https://www.ncaa.org/sports/2021/2/10/sport-science-institute-mental-health.aspx [Accessed 19 Sep 2022].
47. Mountjoy ML, Verhagen E. Bethechange': the responsibility of sports medicine in protecting athletes from Harassment and abuse in sport. BMJ Open Sport Exerc Med 2022;8:e001303.
48. International Olympic Committee: Olympic movement medical code in force as from 31. International Olympic Committee; 2016. Available: https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/Who-We-Are/Commissions/Medical-and-Scientific-Commission/Olympic-Movement-Medical-Code-31-03-2016.pdf [Accessed 10 Sep 2022].
49. van Winden D, van Rijn RM, Savelsbergh G, et al. Characteristics and extent of mental health issues in contemporary dance students. Med Probl Perform Art 2020;35:121–9.
50. Rogge J. An ounce of prevention Br J Sports Med 2009;43:627.
51. Reiger D, Goldberg D, Ustun B, et al. DSM-5 and ICD-11 classifications. In: New Oxford Textbook of Psychiatry. Oxford UK: Oxford, 2020.