



# Student-Athletes' Mental Health in the European Sport School Context: A Scoping Review

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The purpose of this scoping review was to provide an overview of literature exploring adolescent student-athlete mental health in the European sport school context, with particular emphasis on gender. Five databases were searched for relevant literature: PsycINFO, SPORTDiscus, Scopus, PubMed, and Google Scholar. In total, 26 peer-reviewed published articles met the inclusion criteria. The review indicated that literature on adolescent student-athlete mental health in Europe is dominated by a preoccupation with mental illness rather than mental health and the use of quantitative and cross-sectional research designs. Many studies reported that student-athletes demonstrated lower prevalence and incidence rates of mental illness symptoms compared to the general youth population. Female student-athletes consistently demonstrated higher prevalence of mental illness symptoms compared to males. Practitioners working with adolescent student-athletes can improve their mental health literacy to understand mental health beyond the confines of mental illness and target key areas of burnout and the female experience of mental health.

**Keywords:** sport school programs, burnout, gender, female athletes, adolescent athletes

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In many European countries, there is a long tradition of providing young and talented athletes with the opportunity to combine sport and education to create a dual career (DC; [Morris et al., 2021](#)). Special upper secondary schools (for student-athletes aged 15–18) typically collaborate with sport academies and athletic clubs to provide daily training for athletes, more flexible academic programs, and career planning services ([Thompson et al., 2022](#)). In recent years, there has been an increased interest across Europe in developing specialized sport schools for athletes in the lower secondary education (aged 12–15) as well to facilitate optimal athletic development for talented young athletes at an early age ([Nikander et al., 2021](#)).

With the growing popularity of such sport school programs, sport researchers have become increasingly interested in the well-being of adolescent student-athletes who want to excel both in sport *and* education ([Ryba et al., 2016](#)). It has been widely suggested that being involved in competitive sports may protect adolescent student-athletes from mental health issues ([Kegelaers et al., 2022](#); [Saarinen et al., 2024](#)). Simultaneously achieving in both sports and school, however, may also leave student-athletes vulnerable to mental health problems, due to the intense or even competing demands of both education and sports ([Brand et al., 2013](#)). Indeed, adolescent student-athletes confront simultaneous stressors in their sport (e.g., increased performance pressure, selection issues, injuries) *and* in their education (e.g., academic pressures, demands imposed by tasks and assignments; [Thompson et al., 2022](#)). This can make them vulnerable to psychological distress, decrease their well-being, or even increase the risk of athletes dropping out prematurely from either their chosen sport or their education ([Saarinen et al., 2024](#); [Sorkkila, Ryba, Selänne, & Aunola, 2020](#)).

Accordingly, several recent review studies have now examined the mental health of student-athletes, using both systematic ([Kaishian & Kaishian, 2021](#); [Kegelaers et al., 2022](#)) and narrative ([Egan, 2019](#)) approaches to review. These reviews have targeted different aspects of student-athletes' mental health, such as prevalence of mental illness symptoms ([Kegelaers et al., 2022](#)) and practices that can facilitate mental health and well-being of student-athletes ([Egan, 2019](#)). One common theme of investigation has been comparisons between student-athletes and nonathlete populations. For example, [Kaishian and Kaishian \(2021\)](#) recently found that student-athletes at the college level demonstrated similar or lower symptoms of mental health disorders compared to nonathletes with prevalence rates varying 25%–48% for anxiety, 16%–31% for depression, and 54%–60% for sleep disturbance for student-athletes.

Although insightful, a clear limitation of the existing review literature as a whole is that it has often focused on college student-athletes. Consequently, the status of mental health conditions among younger age groups of student-athletes in lower and upper secondary education (ages 12–18 years old) and how mental health is studied within this age group is not singularly prioritized and consequently not well understood. Increasing understanding (and related practice development) relative to this particular age group is vital. Adolescence, spanning the ages of 12–18 years, is a crucial development period during which adolescents experience rapid psychosocial development and the expansion of their identity, responsibility, and autonomy ([Nurmi, 2004](#)). In addition, student-athletes reach puberty during those years, which radically affects their everyday lives and physical training as well as changes in their school and sport environments due to the multiple sport and educational transitions ([Bentzen et al., 2021](#)). All of these

changes may make adolescent student-athletes more vulnerable to mental health disorders, (depression, anxiety, and eating disorders), which often have their onset during adolescence, typically between the ages of 14 and 18 years (Merikangas et al., 2022). There is, therefore, a clear rationale and pressing need for reviews that extend the scope of what we know about mental health and illness of the 12- to 18-year-old student-athlete age group and how this population is being studied in the field of sport and exercise psychology.

For instance, there is a notable lack of attention to gender differences in the outlined literature. A recent comprehensive review on student-athlete mental health (Kegelaers et al., 2022) reviewed 159 studies and identified that more research on gender differences in the context of adolescent student-athletes is urgently needed, as gender was found to be the most commonly associated variable with mental illness outcomes. Indeed, several reviews focusing on female student-athlete mental health have shown that the prevalence of mental illness conditions among female student-athletes at the elite level is higher than their male counterparts (Küttel & Larsen, 2020; Perry et al., 2021; Tahtinen et al., 2021). Female student-athletes in college and upper secondary sport school level have also been found to be at higher risk of mental health disorders, such as depression, anxiety, and eating disorders, compared to males (Küttel & Larsen, 2020). A clear limitation of earlier reviews on female student-athletes' mental health is, however, that they have focused on elite-level student-athletes, and it is not well understood whether these gender differences develop already during adolescence.

Although the prevalence rates of different mental health disorders are also higher in females compared to males in the general youth population (Hagquist et al., 2019), a growing body of evidence suggests that being a student-athlete can put females even at a heightened risk for mental health disorders. Although some prior reviews have suggested that this might be due to biological differences, such as females being more sensitive to stress (Küttel & Larsen, 2020; Rice et al., 2016), a growing body of research shows that there are many possible risk factors that may contribute to mental health difficulties in female student-athletes (Castaldelli-Maia et al., 2019; Perry et al., 2021). Indeed, it has been suggested that due to the prevailing gender stereotypes that prioritize male normativity and outcomes, female student-athletes often experience additional pressure to achieve an education alongside their sporting career, whereas males often have the privilege to only focus on their sport (Saarinen et al., 2023). Female student-athletes are often less likely to pursue a professional career in sport and less likely to continue their DC even at the high school level (Kuokkanen, Saarinen, Romar, et al., 2024) or level of higher education (Ryba et al., 2021). Female student-athletes also often face unequal training opportunities, limited financial support, sexualization, and societal and personal expectations around traditional gender roles which can negatively impact the mental health of this population (Castaldelli-Maia et al., 2019).

While "mental health" has been conceptualized in different ways, in this paper, our understanding is based on the definition used in the International Society of Sport Psychology's consensus statement (Henriksen et al., 2020), namely that it is "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 his or her community." This statement also aligns well with Keyes' widely used two-continua model of mental health, according to

which mental illness and mental health reflect two essentially distinct dimensions underlying a “complete state” of mental health (Keyes, 2002). This conceptualization has a strong empirical support, and it serves as the foundational framework for examining mental health among student-athletes in this review, as within other studies conducted in the field of sport and exercise psychology (Kegelaers et al., 2022; Küttel & Larsen, 2020; Perry et al., 2021).

Following this rationale, the term *mental illness* is defined here as a diagnosable “condition” or “disorder” that relates to the experiences of individuals (such as depression, anxiety, addiction, obsessions, psychoses, etc.) that impact their thinking, feeling, moods, and behaviors (Keyes, 2002). In line with such theorizing, it is important to note that a student-athlete may experience poor mental health during an injury, for example, without meeting the criteria for a diagnosable mental illness.

Aligning with the consensus statement (Henriksen et al., 2020), we use the term *mental health* in this review broadly and view it as an aspect of a person’s overall well-being (Keyes, 2002). This use encompasses subjective well-being, positive moods and emotions (often termed *affect*), and overall life satisfaction (Diener et al., 1999). Psychological well-being relates to a person’s sense of purpose and encompasses individual autonomy, identity, the cultivation of positive relationships, a sense of mastery over the environment, and a sense of life purpose and personal growth (Keyes, 2007).

The present study had several aims that align with the typical purposes and uses of scoping reviews (Tricco et al., 2018). First, we aimed to provide an overview of empirical research that has examined the mental illness and mental health of adolescent student-athletes within the European sport school context. To provide this overview, we structured our review around the foundational idea that scoping reviews can map the key concepts and ideas that underpin a research area and examine the volume, nature, and characteristics of the available evidence (Arksey & O’malley, 2005). As Tricco et al. (2018) noted, scoping reviews can also be used to identify gaps in evidence. Accordingly, and heeding repeated recommendations to more closely attend to gender differences in mental health, we aimed to examine if and how gender is associated with mental illness and mental health outcomes in the reviewed studies. Finally, scoping reviews often have implications for decision making and help to set research agendas. Thus, our final aim was contribute to the knowledge base that informs policy and practice within sport school programs at the lower secondary education level and to help develop ideas for future research (Henriksen et al., 2020).

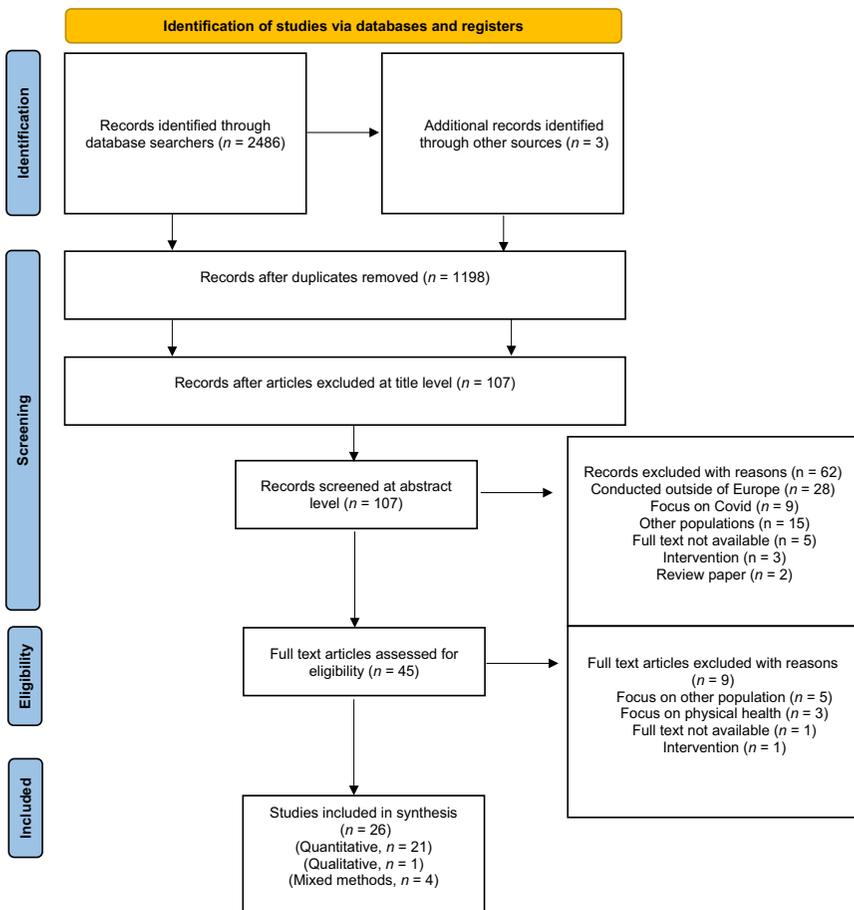
## Methods

### Search Strategy

This review was undertaken using the guidelines and recommendations described in The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (Peters et al., 2020; Tricco et al., 2018).

We have also used considerations for scoping reviews within the field of sport and exercise psychology, as described in Sabiston et al. (2022). The protocol for the present scoping review was not preregistered. Electronic searches of five databases (PsycINFO, SPORTDiscus, Scopus, PubMed, and Google Scholar) were

conducted between June 2023 and February 2024 (see Figure 1). These databases were chosen because they have been used in previous systematic reviews of student-athlete mental health (see e.g., [Kegelaers et al., 2022](#)). They also include research from a variety of disciplines (e.g., general psychology, sport psychology, and exercise science), thereby ensuring the comprehensiveness of the present review. The following keywords were collectively chosen by the author team, after examination of other relevant systematic reviews in both sport psychology ([Kegelaers et al., 2022](#); [Perry et al., 2021](#)) and in general psychology ([Bentley et al., 2019](#)): mental, psychological, psychiatric, health, well-being, illness, secondary school athlete, high school athlete, and student-athlete. Although the role of *burnout* as a mental disorder or as an occupational condition in key classification systems (i.e., International Classification of Diseases-11 and Diagnostic and Statistical Manual of Mental Disorders-5) is still being debated, we decided to include burnout in the present review. This decision was made due to its increasing



**Figure 1** — Study selection flow diagram.

(Ahead of Print)

prevalence in sport psychology literature and because the range of symptoms of burnout have implications both for mental health and mental illness (such as depression), as noted in a recent review of athlete burnout (Glandorf et al., 2023).

Our initial search yielded 2,486 publications (see Figure 1). To be more comprehensive and minimize loss of relevant studies through ambiguous use of key terminology (i.e., mental illness and mental health), three additional articles were identified through alternative sources, such as by manually searching for other academic journals, reference lists, and recent reviews. After duplicate publications were removed, 107 records were screened based on their titles and abstracts. Following this initial screening, 45 articles were retained because they matched our inclusion criteria. The remaining articles were subsequently read and assessed for eligibility by the first and third authors. Potential disagreements were discussed, and the first author made the final decision to include or exclude each article. Following a full-text assessment, 19 papers were removed (see Figure 1 for reasons why), and this resulted in a final selection of 26 papers. Protocols for the inclusions/exclusions and details about the search of the databases can be obtained from the first author upon request.

## Criteria for Inclusion

To be considered for inclusion in this review, the research papers had to have been published as full papers in a peer-reviewed journal in the English language from the year 2000 or later. The rationale for restricting the search to this period was primarily because mental health is a relatively new area of research in sport (Kegelaers et al., 2022), and during the initial scoping searches, we found that works published prior to 2000 were rare, and those that were identified did not meet our other inclusion criteria. The scope of our review was limited to studies of adolescent student-athletes (12–18 years of age) and restricted further to the context of European sport schools due to the similarity of sport school programs, the educational systems, and the shared cultural contexts of European countries. Specific inclusion/exclusion criteria were established in accordance with the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, Research type) described in Cooke et al. (2012), which offers guidance on standardized systematic search strategies. These inclusion/exclusion criteria are shown in Table 1.

## Characteristics of the Included Studies

Each of the included studies was read and annotated, and data were extracted to develop a comprehensive table of study characteristics (see Table 2). The extracted data from each study included the study aim(s), the study design, the participant characteristics (i.e., sample size, mean age, gender, sport), the country and setting of the study, the measurements used, and the key findings.

# Results

## Study Characteristics

Table 2 provides an overview of the characteristics of the studies included in our final data set of 26 studies. These included 21 quantitative studies, four mixed

**Table 1 Inclusion/Exclusion Criteria According to the Sample, Phenomenon of Interest, Design, Evaluation, Research Type Framework**

	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Sample	Current student-athletes enrolled in a lower or upper secondary sport school program in Europe.	Studies not clearly embedded in sport school programs (i.e., studies focusing on athletes in sport clubs without the educational context). Studies focusing on physically active students.
Phenomenon of interest	One or more primary mental health outcome(s). This was defined as being part of the main research questions. Mental illness could include symptoms of specific mental disorders or subclinical indicators of mental illness. Mental health could include indices of different well-being dimensions.	Mental health-related behaviors (i.e., help-seeking).
Design	Longitudinal and/or cross-sectional designs.	Intervention studies.
Evaluation	Studies focusing on the presence/prevalence of mental health outcome(s), comparisons with other populations, and assessing determinants of mental health outcomes.	Studies using secondary data sources. Studies focusing exclusively on instrument development/validation.
Research type	Qualitative, quantitative, and mixed methods research.	Theoretical or review papers.

methods studies, and one qualitative study. Sixteen of the studies had a cross-sectional and 10 a longitudinal research design. Notably, most of the included studies were conducted in the Nordic countries in Finland ( $n = 8$ ), Norway ( $n = 6$ ), and Sweden ( $n = 6$ ). Further European representation included Germany ( $n = 5$ ) and Switzerland ( $n = 1$ ). Collectively, the studies included a substantial participant pool of 13,653 individuals.

The gender distribution of the studies that specified the gender of the participants was 54% male ( $n = 6,046$ ) and 45% female ( $n = 5,132$ ); two studies ( $n = 2,525$ ) did not specify the gender of the participants. Most of the studies of student-athletes focused on the educational context of upper secondary education ( $n = 19$ ), and four studies were of student-athletes in lower secondary education. Three studies did not explicitly specify the educational level of the participants. The mean age of the participants across all the included studies was 15.7 years. The types of sport settings also varied considerably: Most studies ( $n = 25$ ) included both individual and team sport athletes. One study focused on student-athletes who were engaged solely in individual sports. The studies included in this review typically

**Table 2 Summary of the Included Studies**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Brand et al. (2013)	Psychological Symptoms and Chronic Mood in Representative Samples of Elite Student-athletes, Deselected Student-athletes and Comparison Students	Stress and anxiety/ Examine self-reported psychological symptoms and chronic mood	Quant/ Cross-sectional	786 athletes (aged 12–15), 80 deselected athletes, 432 nonathletes	Germany, lower secondary sport schools (athletes and deselected athletes), regular schools (controls)	Composite International Diagnostic Screener, Multidimensional Mood Questionnaire	Multisport	Females reported more symptoms, and female deselected athletes more at risk. Athletes deselected from high-performance sports more at risk than comparison groups
Fiedler et al. (2023)	Digital Media and Mental Health in Adolescent Athletes	Digital media addition/Explore how adolescent athletes' usage of digital media is related to their mental health	Quant/ Cross-sectional	263 F/326 M ( $M_{age} = 15.43$ , $SD = 1.79$ )	Germany, sports federations, sport clubs, and sports boarding schools	Gaming Disorder Scale for Adolescents Scale	Multisport	Longer daily social media usage was connected to increased negative affect and dysfunctional eating patterns
Gerber et al. (2018)	Effects of Stress and Mental Toughness on Burnout and Depressive Symptoms: a Prospective Study with Young Elite Athletes	Depression/Examine the presence of clinically relevant symptoms of burnout and depression, and a possible interaction of perceived stress and mental toughness in the prediction of these symptoms	Quant/ Longitudinal	93 F/164 M ( $M_{age} = 16.82$ , $SD = 1.44$ )	Switzerland, Swiss Olympic Sport Classes	Patient Health Questionnaire, Perceived Stress Scale	Multisport	The percentage of athletes with clinically relevant levels of burnout and depressive symptoms was around 10%. Participants with higher mental toughness scores reported significantly fewer mental health issues when exposed to high stress. Male athletes scored higher on mental toughness

*(continued)*

**Table 2 (continued)**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Gerber et al. (2022)	Perceived Recovery and Stress States as Predictors of Depressive, Burnout, and Insomnia Symptoms and to Examine the Predictive Value of Athletes	Stress and psychological symptoms/Monitor recovery-stress states, and to examine the predictive value of recovery and stress states for depressive, burnout, and insomnia symptoms	Quant/ Longitudinal	42 F/93 M ( $M_{age} = 16.76$ $SD = 1.36$ )	Germany, Swiss Olympic partner schools	Acute Recovery and Stress Scale, Patient Health Questionnaire	Multisport	Participants reported higher recovery than stress states across the entire school year. Lower recovery and higher stress states significantly predicted mental health problems
Gustafsson et al. (2010)	Exploring the Relationship Between Hope and Burnout in Competitive Sport	Burnout/Examine the relationship between hope and athlete burnout among competitive athletes	Quant/ Cross-sectional	63 F/115 M ( $M_{age} = 17.1$ , $SD = 1.2$ )	Sweden, upper secondary sport schools	Athlete Burnout Questionnaire	Multisport	Hope was negatively correlated with burnout. Low-hope athletes scored significantly higher than medium- and high-hope athletes on burnout. Agency thinking was a significant predictor of burnout
Gustafsson et al. (2016)	Profiles of Perfectionism, Parental Climate, and Burnout Among Competitive Junior Athletes	Burnout/Examine whether discernible groups can be identified based on scores of perfectionism and perceptions of parent-initiated climate and, then, whether these groups differ in terms of burnout	Quant/ Cross-sectional	113 F/124 M ( $M_{age} = 16.99$ , $SD = 0.80$ )	Sweden, upper secondary sport schools	Athlete Burnout Questionnaire	Multisport	Four distinct groups identified. Highly perfectionistic athletes in a task-involving climate and highly perfectionistic athletes in a mixed climate reported higher levels of burnout in comparison to other groups

(continued)

**Table 2 (continued)**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Gustafsson et al. (2017)	Fear of Failure, Psychological Stress, and Burnout Among Adolescent Athletes Competing in High Level Sport	Burnout/Investigate fear of failure in highly competitive junior athletes and the association with psychological stress and burnout	Quant/ Cross-sectional	105 F/148 M ( $M_{age} = 16.95$ , $SD = 0.86$ )	Sweden, upper secondary schools	Athlete Burnout Questionnaire	Multisport	Fear of experiencing shame and embarrassment had a statistically significant effect on perceived psychological stress and one dimension of burnout. Athletes with high levels of fear failure on all dimensions scored high on burnout
Gustafsson et al. (2018)	Performance-Based Self-Esteem and Athlete-Identity in Athlete Burnout: A Person-Centered Approach	Burnout/Examine whether profiles of burnout can be identified based on the athletes' identity and performance-based self-esteem	Quant/ Cross-sectional	158 F/290 M ( $M_{age} = 17.6$ )	Sweden, upper secondary schools	Athlete Burnout Questionnaire	55% team sports, 45% individual sports	Four groups: Low burnout profile ( $n = 131$ ), moderate burnout profile ( $n = 178$ ), moderately high burnout profile ( $n = 125$ ), and high burnout profile ( $n = 37$ )
Heikura et al. (2023)	Student-Athletes' Mood State Profiles: The Role of Sports, Sex, and Performance Level in Sports and in School	Mood states/Provide information on the mental health of high school athletes by investigating their mood state profiles and the potential associations of sex, type of sport, and levels of performance in sports and school with those profiles	Quant/ Cross-sectional	226 F/218 M (aged 16–17)	Finland, upper secondary schools	Profile of Mood State Questionnaire	47% individual sports, 53% team sports	The majority of the student-athletes (53%) displayed a negative mood state. Males displayed a more positive mood state than females. Athletes with a more negative mood state had a lower Grade Point Average

(continued)

**Table 2 (continued)**

Authors	Study title	Main focus/aims	Design	Participants	Country	Measurement(s)	Sport(s)	Key findings
Hrozanova et al. (2021)	When I Sleep Poorly, It Impacts Everything: An Exploratory Qualitative Investigation of Stress and Sleep in Junior Endurance Athletes	Sleep disturbance/ Investigate the themes of stress and sleep, and the associations between these variables	Mixed/ Cross-sectional	3 F/3 M ( $M_{age} = 17.7$ , $SD = 0.5$ )	Norway, upper secondary schools	Pittsburgh Sleep Quality Index, Ford Insomnia Response to Stress Test, Qualitative interviews	Individual sports	Stress categorized into specific stressors and reactions to stress, while sleep was divided into sleep benefits and sleep quality. All athletes recognized stressors and were cognizant of the advantages of sleep for their athletic performance
Ingrell et al. (2019)	Developmental Changes in Burnout Perceptions Among Student-Athletes: An Achievement Goal Perspective	Burnout/Examine the developmental trajectories of student-athlete burnout perceptions and the relationship between achievement goals and burnout perceptions	Quant/ Longitudinal	30 F/48 M ( $M_{age} = 12.7$ , $SD = 0.44$ )	Sweden, lower secondary school	Athlete Burnout Questionnaire	Multisport	Burnout perceptions increased over the 3-year period. Task orientation was significantly and negatively related to a reduced sense of accomplishment and sport devaluation
Kuokkanen et al. (2022)	Toward Adjustment Profiles for Lower Secondary Student-Athletes in The Finnish Dual Career Context: A Mixed-Methods Approach	Burnout/Identify adjustment profiles among student-athletes based on measures of engagement and burnout in school and sport and to extract experiences that describe the distribution of student-athletes in the profiles	Mixed/ Cross-sectional	106 F/111 M ( $M_{age} = 14$ , $SD = 0.4$ )	Finland, lower secondary schools	School Burnout Inventory, Sport Burnout Inventory —Dual Career Form	35% individual sports, 65% team sports	Three distinct profiles: Well-adjusted (56%), Reasonably functioning (34%), and Struggling (10%). Interviews revealed that occasional physical exhaustion and school-related stress were common adjustment issues

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**Table 2 (continued)**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Martinsen et al. (2010)	Dieting to Win or to be Thin? A Study of Dieting and Disordered Eating Among Adolescent Elite Athletes and Non-Athlete Controls	Eating disorders/ Examine the prevalence of dieting, reasons for dieting and prevalence of disordered eating among adolescent athletes and age-matched controls, and examine the differences between athletes competing in leanness and non-leanness sports	Quant/ Cross-sectional	217 F/389 M (athletes) 158 F/197 M (controls), aged 15–16	Norway, upper secondary sport schools (athletes), ordinary upper secondary schools (controls)	Eating Disorder Inventory-2	Multisport	The higher prevalence of symptoms of disordered eating among controls compared with athletes. Female athletes reported a higher prevalence of symptoms of eating disorders
Martinsen and Sundgot-Borgen (2013)	Higher Prevalence of Eating Disorders Among Adolescent Elite Athletes Than Controls	Eating disorders/ Examine the prevalence of eating disorders among female and male adolescent elite athletes and nonathletic controls	Quant/ Cross-sectional	611 athletes, 355 controls, aged 15–16	Norway, upper secondary sport schools (athletes), ordinary upper secondary schools (controls)	Eating Disorder Inventory-2, Eating Disorder Examination 16:0	Multisport	A high prevalence of eating disorders among adolescent elite athletes, although more controls than athletes self-reported symptoms associated with eating disorders. Female athletes reported a higher prevalence of eating disorder symptoms

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**Table 2 (continued)**

Authors	Study title	Main focus/aims	Design	Participants	Country	Measurement(s)	Sport(s)	Key findings
Moazami-Goodarzi et al. (2020)	Antecedents and Consequences of Student-Athletes' Identity Profiles in Upper Secondary School	Identity/Examine student-athletes' identity in the upper secondary school context, where student-athletes are faced with academic and athletic experiences and expectations that may affect the development of their student and athletic identities	Quant/ Longitudinal	199 F/192 M, ( $M_{age} = 16$ , $SD = 0.17$ )	Finland, upper secondary schools	Athletic Identity Measurement Scale, Athletic Identity Measurement Scale modified to an academic context	50% individual sports, 50% team sports	Three distinct identity profiles: Dual identity (77%), Athletic identity (18%), and Changing identity (5%). Female student-athletes were more likely than male student-athletes to demonstrate a dual identity than a changing identity profile
Moen et al. (2019)	Burnout and Perceived Performance Among Junior Athletes—Associations with Affective and Cognitive Components of Stress	Burnout/Investigate the associations between cognitive and affective components and athlete burnout and perceived performance among junior student-athletes	Quant/ Cross-sectional	346 F/330 M ( $M_{age} = 18$ )	Norway, upper secondary schools	Athlete Burnout Questionnaire	Multisport	Athlete resilience is a key in understanding athlete burnout and perceived performance, and that cognitive and affective reactions are important mediators in this process
Rosendahl et al. (2009)	Dieting and Disordered Eating in German High School Athletes and Non-Athletes	Eating disorders/ Examine weight concerns, dieting, body dissatisfaction, as well as the eating behavior of German high school athletes and compare the disordered eating behavior of these athletes with regular high school students	Quant/ Cross-sectional	210 F/366 M athletes (aged 14–18), 169 F/ 122 M controls (aged 14–18)	Germany, upper secondary schools (athletes), ordinary upper secondary schools (controls)	Eating Attitude Test	Multisport	Athletes did not show a higher frequency of disordered eating than nonathletes. Female gender and dietary experience predicted disordered eating

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**Table 2 (continued)**

Authors	Study title	Main focus/aims	Design	Participants	Country	Measurement(s)	Sport(s)	Key findings
Rosenvinge et al. (2018)	Are Adolescent Elite Athletes Less Psychologically Distressed Than Controls? A Cross-Sectional Study of 966 Norwegian Adolescents	Psychological distress/ Investigate the prevalence of psychological distress among young elite athletes and age-matched controls	Quant/ Cross-sectional	221 F/390 M athletes; 156 F/199 M controls (aged 15–16)	Norway, upper secondary sport schools (athletes), ordinary upper secondary schools (controls)	Hopkin's Symptoms Checklist	Multisport	A significantly higher proportion of controls scored above the cutoff point for marked psychological distress. Female athletes reported higher scores of psychological distress
Ryba et al. (2021)	Implications of The Identity Position for Dual Career Construction: Gendering the Pathways to (Dis) Continuation	Identity/Examine how gender functions in the narrative construction of dual career styles, and how these styles impact the (dis) continuation of a dual career pathway	Qual/ Longitudinal	10 F/8 M (aged 16)	Finland, upper secondary sport schools	Individual interviews at four time points using a life story approach	66% individual sports, 33% team sports	Female athletes typically combined sport and school in a balanced way, whereas male athletes prioritized their athletic pursuits. An imbalance between sport and education often led to the termination of either the athletic or academic career
Sorkkila et al. (2017)	A Person-Oriented Approach to Sport and School Burnout in Adolescent Student-Athletes: The Role of Individual and Parental Expectations	Burnout/Examine what kind of burnout profiles exist among student-athletes based on their sport and school burnout symptoms and the extent to which these profiles are predicted by parental expectations	Quant/ Cross-sectional	199 F/192 M ( $M_{age} = 16$ , $SD = 0.17$ ) (athletes) 260 mothers/188 fathers	Finland, upper secondary sport schools	School Burnout Inventory, Sport Burnout Inventory —Dual Career Form	50% individual sports, 50% team sports	Four burnout profiles were identified: Well-functioning (60%), mild sport burnout (28%), school burnout (10%), and severe sport burnout (3%). Athletes' and parents' success expectations protected against burnout in the same domain

(continued)

**Table 2 (continued)**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Sorkkila et al. (2018)	The Co-Developmental Dynamic of Sport and School Burnout Among Student-Athletes: The Role of Achievement Goals	Burnout/Examine the co-developmental dynamic of sport and school burnout in Finnish adolescent student-athletes across the first year of upper secondary school	Quant/ Longitudinal	199 F/192 M ( $M_{age} = 16$ , $SD = 0.17$ )	Finland, upper secondary schools	School Burnout Inventory, Sport Burnout Inventory —Dual Career Form	50% individual sports, 50% team sports	Burnout dimensions in a particular domain were substantially stable within the same domain during the first year of upper secondary school and that school-related exhaustion at the beginning of upper secondary school predicted sport-related exhaustion at the end of the school year
Sorkkila et al. (2019)	The Role of Resilience in Student-Athletes' Sport and School Burnout and Dropout: A Longitudinal Person-Oriented Study	Burnout/Examine whether there are different kinds of profiles—based on the level and development of sport and school burnout symptoms across upper secondary school—that can be identified among student-athletes and how resilience and the likelihood of dropping out from sport or school differ between the profiles	Quant/ Longitudinal	241 F/250 M ( $M_{age} = 16$ , $SD = 0.17$ )	Finland, upper secondary schools	Sport Burnout Inventory—Dual Career Form, School Burnout Inventory	50% individual sports, 50% team sports	Three burnout profiles were identified: Average profile (60%), increased burnout profile (32%), and nonrisk profile (8%). Those in the Increased burnout group were less resilient and more likely to dropout from sport than those in the other two groups

(continued)

**Table 2 (continued)**

Authors	Study title	Main focus/aims	Design	Participants	Country	Measurement(s)	Sport(s)	Key findings
Sorkkila, Ryba, Selänne, and Aunola (2020)	Development of School and Sport Burnout in Adolescent Student-Athletes: A Longitudinal Mixed-Methods Study	Burnout/Investigate the development of school and sport burnout in adolescent student-athletes during their first year in upper secondary school using an embedded mixed-methods design	Mixed/ Longitudinal	194 F/179 M ( $M_{age} = 16$ , $SD = 0.17$ ) (quantitative sample) 10 F/7 M (aged 16–17) (qualitative sample)	Finland, upper secondary schools	School Burnout Inventory, Sport Burnout Inventory —Dual Career Form, Qualitative interview	50% individual sports, 50% team sports	Four burnout profiles: Nonrisk profile (42%), burnout risk profile (33%), developed burnout profile (13%), and well-functioning profile (12%)
Stambulova et al. (2015)	Searching for an Optimal Balance: Dual-Career Experiences of Swedish Adolescent Athletes	Identity/Examine adolescent student-athletes' dual career experiences during their first year at national elite sport schools	Mixed/ Longitudinal	261 (quantitative sample) 10 (qualitative sample) (aged 16)	Sweden, upper secondary sport schools	Athletic Identity Measurement Scale, Student Identity Measurement Scale, Qualitative interviews	Multisport	Significant changes in the participants' transition variables from the first to the second measurement accompanied by rather high perceived quality of adjustment at sport high school

(continued)

**Table 2 (continued)**

<b>Authors</b>	<b>Study title</b>	<b>Main focus/aims</b>	<b>Design</b>	<b>Participants</b>	<b>Country</b>	<b>Measurement(s)</b>	<b>Sport(s)</b>	<b>Key findings</b>
Stormaas et al. (2023)	Mental Health Profiles Among 13- To 16-Year-Old Norwegian Talent and Mainstream Students—A Prospective Person-Centered Analytical Approach	To examine symptoms of anxiety, depression, body concerns, and self-worth among young talent development and mainstream students	Quant/Longitudinal	76 F/92 M (student-athletes) 373 F/403 M (ordinary students) (aged 13–14)	Norway, lower secondary sport and ballet schools, ordinary lower secondary schools	Revised Children's Anxiety and Depression Scale	Multisport	Females reported more weight-shape concerns. Four different profiles. Male student-athletes most likely demonstrated a mentally healthy profile and females a moderate profile. Males transitioned into healthier profiles and females into unhealthier ones
Weber et al. (2018)	Symptoms of Anxiety and Depression in Young Athletes Using the Hospital Anxiety and Depression Scale	Anxiety and depression/Assess overall symptoms of anxiety and depression in young athletes as well as possible sex differences	Quant/Cross-sectional	171 F/155 M ( $M_{age} = 14.3$ , $SD = 1.6$ )	Germany, elite sport schools	Hospital Anxiety and Depression Scale	Multisport	80% of young athletes did not demonstrate clinically relevant scores of anxiety or depression. No significant differences between male and female athletes in depression subscale

focused on either mental illness or mental health outcomes. In the following section, and to help provide a comprehensive overview of the existing literature, we adopted a pragmatic categorization strategy, classifying the reviewed studies into one of two categories based on their primary thematic focus, namely, mental illness or mental health.

## Studies Focusing on Mental Illness

A total of 22 studies of the included studies focused primarily on one or more mental illnesses. The predominant methodological approach used in these studies ( $n = 19$ ) was quantitative. Additionally, three studies adopted a mixed methods approach (Hrozanova et al., 2021; Kuokkanen et al., 2022; Sorkkila, Ryba, Selänne, & Aunola, 2020). Nineteen of the studies were cross-sectional, and three were longitudinal. The studies covered a wide topic of research topics, including sport (and) school burnout ( $n = 11$ ); anxiety, depression, and stress ( $n = 6$ ); eating disorders ( $n = 3$ ); sleep disturbance ( $n = 1$ ); and digital media addiction ( $n = 1$ ).

### **Burnout**

Burnout within the student-athlete population (whether exclusive to sport or encompassing both sport and school burnout) was examined in 11 studies. The Athlete Burnout Questionnaire (Raedeke & Smith, 2001) was the instrument of assessment in the seven studies that were dedicated exclusively to sport burnout (Gustafsson et al., 2010, 2016, 2018, 2017; Ingrell et al., 2019; Moen et al., 2019). The five studies that examined both sport and school burnout (Kuokkanen et al., 2022; Sorkkila et al., 2017, 2018; 2019; Sorkkila, Ryba, Selänne, & Aunola, 2020) employed the Sport Burnout Inventory—DC Form to evaluate sport burnout (Sorkkila, Ryba, Aunola, et al., 2020) and used the School Burnout Inventory (Salmela-Aro et al., 2009) to gauge school burnout. The findings revealed that although the prevalence of sport and school burnout at the beginning of lower and secondary education tends to be around 10%, the levels often increase during both lower (Ingrell et al., 2019;  $n = 78$ ) and upper secondary education (Sorkkila et al., 2019;  $n = 491$ ). For example, Sorkkila, Ryba, Selänne, and Aunola (2020) suggested that around 35% of the student-athletes may be at risk for sport and school burnout at the end of the first year in upper secondary sport school ( $n = 391$ ).

The literature reviewed demonstrates that burnout has several antecedents and correlates that warrant discussion. Kuokkanen et al. (2022) examined sport and school burnout profiles among lower secondary sport school students ( $n = 217$ ) and found that a majority of them (55%) demonstrated a low risk for sport burnout at the end of the second school year. Ingrell et al. (2019;  $n = 78$ ) noted that task orientation was negatively related to sport burnout, while Moen et al. (2019;  $n = 670$ ) found that more resilient student-athletes had lower sport burnout scores in lower secondary sport schools. Sorkkila et al. (2019) similarly observed that student-athletes in upper secondary sport schools with increased sport and school burnout scores (32% of the participants) were less resilient and more likely to dropout from sport compared to others ( $n = 491$ ).

Gustafsson et al. (2016) found that highly perfectionistic student-athletes in a parental climate that emphasizes learning and cooperation within task-involving

parental climate reported the highest levels of athletic burnout ( $n = 237$ ). Similarly, Sorkkila et al. (2018) found that task-oriented goals in sport and school decreased the likelihood for burnout symptoms in the same domain ( $n = 391$ ). Moreover, Gustafsson et al. (2018) examined student-athletes' sport burnout profiles in upper secondary education and found that those with high athletic identity and low performance-based self-esteem were less likely to be burned out in sport ( $n = 448$ ). The same authors (Gustafsson et al., 2017) found that fear of experiencing shame and embarrassment had a statistically significant effect on perceived psychological stress and sport burnout symptoms: Athletes with high levels of fear failure scored high on sport burnout ( $n = 253$ ). Only Kuokkanen et al. (2022) and Sorkkila et al. (2017) included gender as a background variable in their analyses, but no gender differences in burnout symptoms were found.

### **Anxiety, Depression, and Stress**

Six of the studies included in this review investigated some combination of anxiety, depression, and stress experienced by adolescent student-athletes. Each of the studies used different assessment tools. Brand et al. (2013) used The Composite International Diagnostic-Screener (Wittchen et al., 1999) to identify symptoms of anxiety and depression. Gerber et al. (2018, 2022) used the Patient Health Questionnaire (Kroenke et al., 2001) to evaluate depressive symptoms, the Acute Recovery and Stress Scale (Hitzschke et al., 2016) to assess current recovery and stress states. They also used the Mental Toughness Questionnaire 48 to measure mental toughness, referring to propensity to handle the demands of environmental stressors under four dimensions (commitment, challenge, control, and confidence; Clough et al., 2002). Rosenvinge et al. (2018) used Hopkin's Symptoms Checklist (Strand et al., 2003) to measure psychological distress, and Stornæs et al. (2023) used the Revised Children's Anxiety and Depression Scale to assess symptoms of general anxiety (Ebesutani et al., 2012). Finally, Weber et al. (2018) utilized The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) to evaluate states of depression and anxiety among adolescent student-athletes.

Weber et al. (2018) examined the prevalence of anxiety and depression among student-athletes in upper secondary education ( $n = 326$ ) and observed that 20% of them exhibited anxiety and depression scores that were above clinically relevant threshold for diagnosable depression or anxiety disorder. The authors did not find any gender differences. Gerber et al. (2018), in contrast, found that approximately 10% of student-athletes reported clinically relevant levels of sport burnout or depression in upper secondary education ( $n = 257$ ). Those who reported higher levels of mental toughness scores reported significantly fewer mental health issues when exposed to high stress. Male student-athletes scored higher on mental toughness compared to females, and female student-athletes reported more stress and depressive symptoms compared to males.

Rosenvinge et al. (2018;  $n = 966$ ) and Brand et al. (2013;  $n = 1,298$ ) examined the prevalence of psychological distress and psychological symptoms among student-athletes in comparison to age-matched control participants. Both the studies found that students in the control groups, rather than the student-athletes, were more likely to report elevated levels of psychological distress (20% vs. 7%) and that female student-athletes exhibited higher scores of psychological distress and psychological

symptoms than their male counterparts (13% vs. 4%). Stornæs et al. (2023) who examined mental health profiles among student-athletes, ballet dancers, and control participants had similar findings ( $n = 944$ ): Female controls reported the highest levels of anxiety and depression. Male student-athletes were most likely to demonstrate a mentally healthy profile, whereas female student-athletes typically belonged to the moderately healthy profile. Male student-athletes transitioned into healthier profiles and female student-athletes into unhealthier ones.

### **Eating Disorders**

Three of the studies included in this review focused on eating disorders. Different assessment tools were employed across these investigations, all of which were conducted among student-athletes in upper secondary education. Rosendahl et al. (2009) applied the Eating Attitude Test (Garner et al., 1982) that is a screening instrument for assessing at-risk eating behaviors. Both Martinsen et al. (2010) and Martinsen and Sundgot-Borgen (2013) utilized the Eating Disorder Inventory 2 (Garner, 1991) to examine self-reported eating disorders. Additionally, the latter study integrated clinical interviews based on the Eating Disorder Examination Questionnaire (Fairburn, 2008). Each of these three studies explored the prevalence of eating disorders among student-athletes and age-matched controls from ordinary (i.e., nonsport school) upper secondary schools.

Both Martinsen et al. (2010;  $n = 961$ ) and Rosendahl et al. (2009;  $n = 867$ ) reported that eating disorders were more prevalent among those in the age-matched control groups compared to the student-athletes, the prevalence being around 4% for student-athletes and 9% for controls. However, Martinsen and Sundgot-Borgen (2013;  $n = 966$ ) noted that although more age-matched participants in the control groups reported symptoms associated with eating disorders (50% vs. 25%), the actual prevalence of eating disorders was higher among student-athletes when they were assessed through clinical interviews as well (7% and 3%). All three studies identified a higher prevalence of eating disorders among female student-athletes compared to their male counterparts (14% vs. 3%).

### **Sleep Disturbance**

Hrozanova et al. (2021) focused on examining junior endurance athletes' stress and sleep in upper secondary sport school ( $n = 6$ ). The data were collected using in-depth interviews regarding stress experiences, which were complemented with the following quantitative measurements: Sleep quality was assessed using the Pittsburgh Sleep Quality Index (Pallesen et al., 2005), and stress-related sleep disruption was evaluated using the Ford Insomnia Response to Stress Test (Drake et al., 2014).

Drawing from the interview data, the student-athletes talked about stress in two distinct ways: Some referred to specific stressors that they had experienced, while others discussed their reactions in response to stressors. Similarly, the student-athletes used two distinct ways to reflect on their perspectives about sleep: Some, for example, highlighted the *advantages* of sleep, while others concentrated on their *ability* to secure adequate sleep. Three student-athletes reported positive adaptive responses to stress, evidenced by good sleep quality, minimal sensitivity to sleep disturbances, and low levels of mental strain. In contrast, three student-athletes exhibited maladaptive responses to stress, achieved subpar sleep quality,

demonstrated high sensitivity to sleep disturbances, and grappled with higher levels of mental strain. The study did not investigate potential gender differences in the stress perceptions, however.

### **Digital Media Addiction**

Fiedler et al. (2023) examined the relationship between digital media addiction and the mental health of adolescent student-athletes in both lower and upper secondary schools ( $n = 591$ ). The researchers used the Gaming Disorder Scale for Adolescents (Paschke et al., 2020) to evaluate the presence of addiction symptoms that are related to digital media. The analysis revealed a statistically significant and positive correlation between the amount of time that the student-athletes spent on social media and the emergence of symptoms linked to digital media addiction. This addiction was associated with a cascade of adverse outcomes, including heightened negative emotionality, indicators of disordered eating, intensified social comparison, and a marked decline in the quality of sleep among the participants. In terms of gender differences, a slightly higher proportion of female student-athletes (30%) reported inadequate amounts of sleep compared to their male counterparts (25%). Likewise, female student-athletes demonstrated higher levels of social comparison tendencies and exhibited a greater proclivity toward disordered eating behaviors compared to males.

## **Studies Focusing on Mental Health**

Four studies in the present review examined mental health outcomes. Of these, two used quantitative research designs (Heikura et al., 2022; Moazami-Goodarzi et al., 2020), one used a qualitative research design (Ryba et al., 2021), and one employed a mixed methods approach (Stambulova et al., 2015). The subject matter of these studies included identity ( $n = 3$ ) and mood states ( $n = 1$ ). One of the studies was cross-sectional, while others had a longitudinal research design.

### **Identity**

Three of these studies focused on the athletic and student identity of student-athletes. Moazami-Goodarzi et al. (2020) and Stambulova et al. (2015) utilized the Athletic Identity Measurement Scale (Brewer et al., 1993) to assess the athletic identity. To measure student identity, the Athletic Identity Measurement Scale adapted to an academic context was used. Ryba et al. (2021) used life story interviews to explore how gender impacted the construction of student-athletes' identities.

Moazami-Goodarzi et al. (2020) identified three distinct identity profiles in their Finnish student-athlete sample ( $n = 391$ ): a dual identity (77%) of the sample, an athletic identity (18%), and a changing identity (5%). These distinct profiles were associated with different levels of school achievement and sport dropout among the student-athletes. Student-athletes with a dual identity achieved a higher grade point average than student-athletes with an athletic identity profile but were also more inclined to withdraw from sports at the end of the last year of upper secondary sport school. Female student-athletes were more likely to exhibit a dual identity profile rather than a changing identity profile. Aligned with these findings, Ryba et al. (2021) who interviewed 18 student-athletes found that females often

combined sport and schoolwork in a more balanced way, whereas male student-athletes tended to prioritize their athletic endeavors over their education. Male student-athletes also frequently circumvented the dual tensions they faced by deciding to opt out of education instead. In contrast, female student-athletes attempted to “succeed at everything” and endeavored to excel simultaneously in both sports and school.

### **Mood States**

Heikura et al. (2023) examined student-athletes’ mood state profiles and investigated the potential influence of gender, the type of sport played by the student-athletes, and the level of student-athlete performance in both the sport and academic domains within upper secondary sport schools ( $n = 444$ ). An assessment of mood states was conducted using the 37-Item Profile of Mood States questionnaire (Curran et al., 1995).

The researchers found that a majority of the participants (53%) demonstrated a negative mood state, which was characterized by a low level of vigor and by elevated levels of confusion, depression, anger, tension, and fatigue. Notably, a substantially larger proportion of male student-athletes displayed a positive mood state (75%) compared to their female counterparts (25%). Additionally, the mood states of the student-athletes affected their academic performance: Those with more negative mood states were more likely to receive a lower grade point average.

## **Discussion**

The aim of this scoping review was to provide a first and comprehensive overview on the literature on adolescent student-athlete mental health in the European sport school context. As acknowledged in previous reviews (Kegelaers et al., 2022; Küttel & Larsen, 2020; Perry et al., 2021), the findings of the present study showed that mental health literature among adolescent student-athletes is largely dominated by the focus on prevalence and incidence rates of diagnosable mental illness symptoms and cross-sectional quantitative research designs. Although informative, the overreliance on cross-sectional research can be considered as a major methodological limitation among adolescent student-athletes, especially as they are in the middle of their most important developmental years during which changes in their mental health can occur rapidly (Nurmi, 2004). From a developmental and holistic lifespan perspective on athlete career development (Stambulova & Wylleman, 2019), future studies should attempt to use longitudinal research designs to appropriately attend to the stability and change of adolescent student-athlete mental health. Using longitudinal research designs can also help to attend to the different (and changing) contextual factors and relationships (teacher support, parenting, coaching, peer support) that underpin this development over time. In addition, because the focus in the earlier studies has largely been in understanding the prevalence of mental illness symptoms and diagnosable conditions, mental health, and well-being among student-athletes remains largely unexplored. Therefore, and aligned with the consensus statement of Henriksen et al. (2020), there is a need for more comprehensive and balanced examinations of both mental illness *and* mental health among adolescent student-athlete

population, using alternative theoretical frameworks and conceptualizations of mental health (Pereira Vargas et al., 2021).

In addition, the reviewed studies employed a remarkable diversity of measures in relation to each mental illness condition or dimension of mental health investigated (see Table 2 for a list of screening tools that were used). Hence, comparative analysis of the study findings is complex. Because student-athletes need to achieve in both sport and school simultaneously, future studies might especially benefit from adopting measures that also take the school context into consideration (i.e., measure school burnout alongside sport burnout).

Researchers addressed a wide variety of different topics when studying mental illness outcomes among the adolescent student-athlete population. The most commonly studied topic was burnout. The prevalence of sport and school burnout symptoms was found to be around 10% in this population, which is aligned with the findings made among the general youth population (Salmela-Aro & Upadyyaya, 2017). However, because the symptoms of sport and school burnout appear to increase especially throughout the upper secondary sport school (Sorkkila et al., 2019), there is a need to closely follow student-athletes in this age group, again suggesting the need for longitudinal investigation.

Similarly, the studies that examined the prevalence of anxiety, stress, depression, and eating disorders among student-athletes indicated that only a relatively small proportion of them (approximately 10%–20%) exhibited clinically relevant levels of such disorders, whereas the prevalence among the general youth is typically found to be around 25%–30% (Merikangas et al., 2022). The reviewed studies that included control groups consistently showed that the control group members reported higher levels of mental illness compared to the student-athletes. While these findings may point to the positive benefits of participation in youth sport and being a student-athlete, the results should be interpreted with caution. Most importantly, student-athletes often come from backgrounds with higher standards of living than the general youth population (Skrubbeltrang et al., 2020), meaning that they have better access to resources that contribute to better mental health (e.g., social support, access to mental health services; Glazzard & Szreter, 2020). As such, it is an important measure for sport researchers to consider, particularly when placed alongside wider sporting and societal/government goals of inclusion and providing equal opportunities for all to access and participate in sport.

Reviewed studies that examined student-athletes' mental health used a variety of methodological approaches, including quantitative, qualitative, and mixed methods. The reviewed studies most often focused on student-athletes' identity development, and a key finding was that even though especially young student-athletes identify themselves as both athletes and students, the student identity becomes increasingly important when they mature (Moazami-Goodarzi et al., 2020; Ryba et al., 2021). Student-athletes' identity also predicted their academic and athletic achievements, and likelihood for sports dropout, suggesting that it is important that sport schools provide their students with opportunities to develop their identities in a balanced way. In addition, as the negative mood states were linked to lower grade-point averages among student-athletes, sport schools should also be vigilant in ensuring that student-athletes do not become excessively burdened by the pressures of sport and school, given that such pressures could potentially impact their academic performance (Heikura et al., 2023).

The findings from the studies we included drew a relatively consistent picture suggesting that female student-athletes experience higher levels of mental illness compared to males. Studies that examined gender differences in sport and school burnout were scarce but other studies indicated consistently that female student-athletes experienced higher levels of psychological distress (Rosenvinge et al., 2018), anxiety, and depression (Brand et al., 2013) compared to males. Additionally, the prevalence of eating disorders was notably higher among female student-athletes (Martinsen et al., 2010; Martinsen & Sundgot-Borgen, 2013; Rosendahl et al., 2009). Moreover, female student-athletes exhibited more dysfunctional sleep patterns and higher levels of social comparison (Fiedler et al., 2023). Additionally, female student-athletes were more committed to their educational and DC goals (Moazami-Goodarzi et al., 2020; Ryba et al., 2021), and a smaller proportion of female student-athletes exhibited positive mood states compared to males (Gross et al., 2017; Heikura et al., 2023; Kegelaers et al., 2022; McGuine et al., 2021). Although our findings align with studies conducted among the general youth population showing that females often experience a higher prevalence of mental illness symptoms and lower well-being than males (Hagquist et al., 2019; Perry et al., 2021), it is important that sport schools consider their own role and the DC-specific context and do not mistake prevalence of higher mental illness and poorer mental health as indicators of an inherent female vulnerability. Indeed, it is likely that because female student-athletes often experience more pressure to perform well not only in their sports but also in school and social life, this dual pressure can increase their vulnerability for poorer mental health (Kuokkanen, Saarinen, Phipps, et al., 2024; Saarinen et al., 2024). There is also evidence that these views are reinforced by the sport school personnel as, for example, teachers may, due to the gender stereotypes, expect more from females in school, while males may be excused more easily because they are “good at sports” (Muntoni & Retelsdorf, 2018; Saarinen et al., 2023). As such, targeted mental health interventions should be offered for female student-athletes specifically.

## Limitations

First, the inclusion criteria of this scoping review were restricted only to peer-reviewed studies which were published in English. This may therefore have potentially limited the diversity of the findings, although evidence suggests that restricting the search to studies in English language usually does not influence the findings of scoping reviews (Morrison et al., 2012). Second, most of the studies included in this review were conducted in Nordic countries. These countries have similar sport school programs, and caution should therefore be exercised when generalizing the findings reported in this review to other settings. Third, we did not formally register our protocol prior to conducting the study. Although registration can be a useful additional measure to decrease bias and improve reproducibility, we tried to account for this by describing our study protocol in detail in the present paper (Peters et al., 2020).

## Clinical Implications

Our review findings are consistent with recent studies that underscore the significance of prioritizing student-athletes' mental health and well-being as a defining

characteristic of a successful European sport school environment (Storm et al., 2021). Despite the apparently lower levels of clinically relevant mental illness symptoms among student-athletes compared to control groups, sport schools still need to recognize their central role and duty of care in both *preventing* mental illness and *promoting* mental health. These aims can be supported by ensuring easy access to health care professionals and by developing programs and strategies that proactively promote mental health instead of focusing only the prevention of mental illness. These broad recommendations are punctuated by the wider need to increase mental health literacy about what mental health actually is and constitutes. Indeed, promoting good mental health doesn't necessary mean the same thing as preventing mental illness symptoms. Knowing, for instance, that student-athletes could simultaneously have both good mental health and experience mental illness, and vice versa, has implications for both the detection of risk and the referral of student-athletes. Moreover, working directly with mental illness often requires clinical competencies and is frequently identified as a boundary/competency issue for sport psychologists which may discourage or preclude (depending on severity) many practitioners from undertaking such work (Sly et al., 2020). Promoting mental health, however, is a broader and frequently less clinical domain and seems ideally suited to the inclusive, collaborative, and participatory approaches to mental health that are increasingly promoted in community and systems perspectives (Campbell & Burgess, 2012). In such perspectives, mental health service provision is not the unilateral responsibility of any one individual (Campbell & Burgess, 2012). Rather, an "it takes a village" philosophy can encourage student-athletes, teachers, coaches, school social workers, principals, parents, and sport psychologists (practitioner and researchers) to work collaboratively to promote mental health (Goodyear et al., 2022).

Finally, it is crucial to address the unique challenges faced by female student-athletes (Saarinen et al., 2023). Coaches and sport school administrators should examine the underlying assumptions that shape the organization of sport schools and critically evaluate how male normativity shapes the athletic ideals, organizational structures, and coaching strategies (Sotiriadou & De Haan, 2019). It is important that coaches and other sport school personnel recognize the critical role they play in reinforcing the gender stereotypes and, through education and change in organizational practices, aim toward the creation of school sport environments that are more equitable and inclusive of all student-athletes (Ryba et al., 2021).

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