

# A Scoping Review of Intercollegiate Athlete Burnout

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Participation in intercollegiate sport can foster a range of positive individual outcomes (e.g., growth, resilience development). However, research suggests the multitude of demands intercollegiate athletes need to balance (e.g., academic and sport-specific stressors) can also increase their susceptibility to burnout, which is characterized by reduced personal accomplishment, emotional and physical exhaustion, and a sense of sport devaluation. In this scoping review, we sought to identify with whom and how burnout has been studied, as well as summarize factors that have been found to be associated with burnout. Following a systematic literature search, 29 studies were included in the review, comprising 8,022 intercollegiate athletes (55% female). These studies were predominantly quantitative and cross-sectional ( $n = 22$ ) in design, conducted in the United States ( $n = 15$ ), examined participants from multiple sports ( $n = 25$ ), and grounded in the conceptualization by Raedeke and Smith (2001;  $n = 24$ ). The range of factors associated with burnout were organized into four categories: demographic influences (e.g., participant sex, academic year), personal characteristics (e.g., perfectionism, grit), psychosocial states (e.g., motivation, emotions), and interpersonal factors (e.g., social support, coach-athlete relationships). Limitations and current gaps in understanding are highlighted, which notably includes a general inability to identify the directionality of effects between burnout and its correlates. Such gaps give way to recommendations for future research in this area of work, such as examining the unique and independent (statistical) contribution of sport-specific stressors versus other types of stressors (e.g., academic, social, financial) to burnout experiences in intercollegiate athletes. Taken together, the findings from this review could help researchers and stakeholders (e.g., applied practitioners, athletics departments) develop interventions that support performance and wellbeing for this population.

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For many athletes, competing in university athletics represents the culmination of their competitive careers, offering a unique opportunity to engage in high-level sports while pursuing higher education concurrently. This period, however, is a pivotal developmental stage characterized by significant personal transitions and novel challenges, which can lead to both growth and stress (Lopes Dos Santos et al., 2020; Madrigal & Robbins, 2020). Intercollegiate athletes face the dual demands of academic responsibilities and competitive sports, creating an arduous environment as they strive to succeed in both domains of their lives (Hwang & Choi, 2016; Rice et al., 2016). In cases when these intercollegiate athletes encounter a high level of stressors without sufficient coping resources, they risk experiencing *burnout* (Marangoni et al., 2023; Smith, 1986). Indeed, the expectations intercollegiate athletes face in balancing their athletic achievements with ever-mounting academic and social demands have inspired scholars to focus research efforts on athlete burnout specifically in intercollegiate settings (Dubuc-Charbonneau et al., 2014). The purpose of this paper is to review the research examining the experiences of burnout among intercollegiate athletes.

Gustafsson et al. (2008) described athlete burnout as a multidimensional construct shaped by a dynamic interaction of psychological, emotional, personality, and environmental factors. Within a psychosocial framework, the experience of athlete burnout is typically characterized by three core dimensions: (a) *reduced personal accomplishment*, (b) *emotional and physical exhaustion*, and (c) *a sense of sport devaluation* (Raedeke & Smith, 2001). An athlete with a reduced sense of personal accomplishment may feel their sport skills and abilities are insufficient for reaching their personal goals, whereas sport devaluation is characterized by an athlete's loss of interest in sport and lack of caring about their performance (Raedeke & Smith, 2001). The dimension of emotional and physical exhaustion draws from Smith's (1986) perspectives of burnout and stress, wherein stress contributes to burnout, in particular, emotional exhaustion. Athletes who experience burnout are characterized as having not only high emotional exhaustion, but also feeling physically drained from the intense demands of training and competition (Raedeke & Smith, 1997). However, Raedeke (1997) noted that while stress is an integral element of sport, not every athlete who experiences stress will ultimately burn out. In this way, burnout is a subjective phenomenon, as its development and impact are unique to each athlete, thus making it a complex concept to understand fully. What is clear, though, is that several psychological symptoms are associated with burnout, including chronic fatigue, amotivation, and a diminished sense of self-worth (Cresswell & Eklund, 2006; Lonsdale et al., 2009). Emotional responses, such as frustration, anger, and mood disturbances, are recognized as both symptoms and consequences of burnout (Cresswell & Eklund, 2006; Gustafsson et al., 2008). Some personality traits seem related to an increased susceptibility for burnout, such as high trait anxiety (Markati et al., 2019) and perfectionism (Gustafsson et al., 2008). Environmental factors, including external pressures, negative team climates, and inadequate support systems, also play a pivotal role in predicting burnout (Smith, 1986). Such influences are particularly relevant to this review, as universities possess a unique environment characterized by

heightened academic demands that intercollegiate athletes must navigate (Lopes Dos Santos et al., 2020). Social connections within the university environment can significantly shape athletes' experiences and determine how effectively they manage the physical and psychological stresses associated with competitive sports (Marangoni et al., 2023). Left unresolved, burnout can snowball into serious consequences, including recurrent illness and injury, diminished sports performance, and, ultimately, withdrawal from sports (Cresswell & Eklund, 2006; Gustafsson et al., 2008).

To better understand burnout in intercollegiate athletes, one can look to two broad areas of inquiry: (1) research on university student burnout; and (2) research on athlete burnout in other (non-university) settings. First, according to the American College Health Association's National College Health Assessment II Survey, many university students report experiencing average to above-average stress, with nearly 15% describing their stress levels as tremendous (Linden et al., 2018). Environmental factors (e.g., negative school climate, lack of support from teachers) and situational factors (e.g., assignment overload, insufficient academic support, low resources, and financial burdens) are linked with academic burnout (e.g., Cushman & West, 2006; Salanova et al., 2010). Second, reflecting on existing research on athlete burnout, much of this work has focused on elite youth athletes and professional athletes. Similar to research on student burnout, several environmental and situational factors can contribute to elite athletes' experiences of stress, including academic expectations, social obligations, adjusting to life away from home, and financial challenges (Lopes Dos Santos et al., 2020; Paule & Gilson, 2010). In relation to intercollegiate athletes, many stressors are compounded considering the substantial commitments required by their sports (e.g., hours of practice and training sessions, travel for competition) in addition to the demands of being a university student (e.g., hours of studying, social commitments; Lopes Dos Santos et al., 2020; López de Subijana et al., 2015; Madrigal & Robbins, 2020). Importantly, the demands faced by intercollegiate athletes often contribute to increased mental health issues, such as anxiety and depression, which can subsequently impair academic performance and impede daily functioning (Lopes Dos Santos et al., 2020; Madrigal & Robbins, 2020). Evidently, the university environment can heighten the potential for burnout, not only in the academic domain but also in the context of intercollegiate sports (Lopes Dos Santos et al., 2020).

In recent years, empirical advancements have been made in our understanding of burnout among intercollegiate athletes. Despite those contributions, no comprehensive review (to our knowledge) has synthesized the literature on how the combined role of being both a student *and* athlete at a university contributes to the development of athlete burnout in this population. As such, we sought to consolidate the empirical work on burnout amongst intercollegiate athletes, reviewing with whom (e.g., demographic considerations) and how (e.g., study design features) this area has been studied, as well as the factors that have been shown to be associated with burnout in this population. In doing so, our broad aim was to help better inform the prevention, diagnosis, and intervention strategies specific to intercollegiate athletes.

## Method

A scoping review was selected to summarize the breadth of existing studies, identify knowledge gaps, and inform potential future research directions in intercollegiate athlete burnout (Sabiston et al., 2022; Tricco et al., 2016). Whereas other forms of systematic reviews adopt more rigid and confined research questions, scoping reviews enable researchers to address broader, exploratory-based research questions (Colquhoun et al., 2014). Accordingly, scoping reviews maintain a systematic approach, but the final dataset encompasses a wider range of literature, including relevant concepts, evidence, and constraints within the specific area. This scoping review followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist to ensure methodological transparency (Tricco et al., 2018; see Appendix A for completed PRISMA-ScR checklist). With guidance from Sabiston et al. (2022) on scoping reviews in sport, the review was conducted in five stages: (1) identification of the research topic and questions; (2) formulation of inclusion and exclusion criteria; (3) identification of relevant studies; (4) data extraction; and (5) presentation of results. A preliminary search of SPORTDiscus, PsycInfo, PsycArticles, and PubMed revealed no completed or ongoing scoping or systematic reviews on the topic. The study protocol for this scoping review was pre-registered on Open Science Framework on September 18, 2024.<sup>1</sup>

### Eligibility Criteria

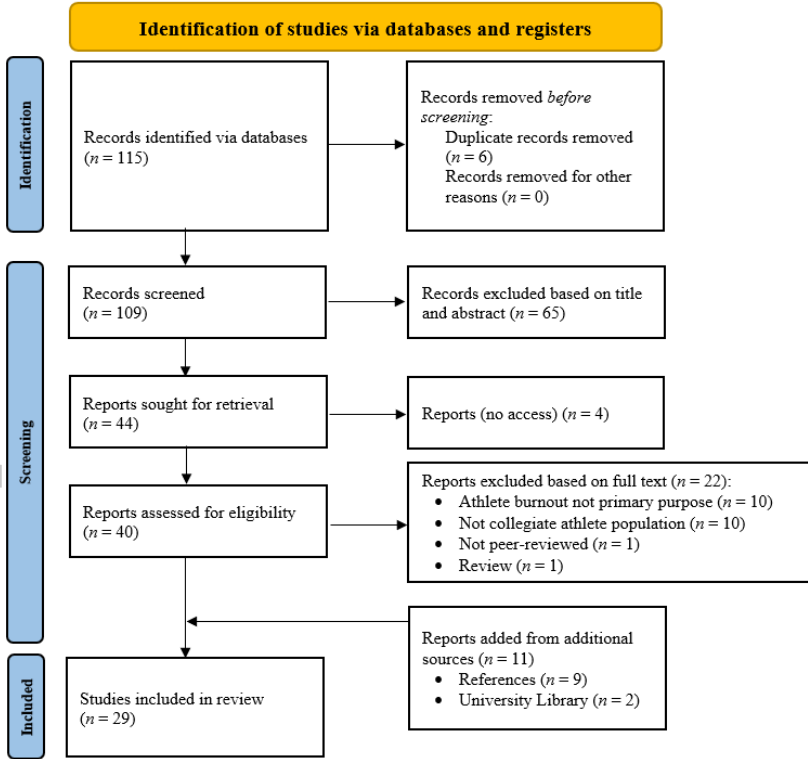
The inclusion and exclusion criteria were determined a priori to ensure a focused and consistent approach to identifying relevant studies. First, studies needed to be original, peer-reviewed research articles. Thus, reviews, meta-analyses, book chapters, dissertations, conference abstracts, and other non-peer-reviewed materials were excluded from the analysis. Second, studies needed to be written in the English language due to resource constraints for translation. Third, study participants were required to be current university or college students participating in collegiate sports at the time of study. As such, articles focusing on non-collegiate athletes (e.g., youth, elite professional) or non-athlete populations (e.g., coaches, parents) were excluded. Articles addressing other psychological variables (e.g., stress, gratitude, grit) were excluded unless burnout was also investigated. No restrictions were placed on publication date, sport type, country of origin, research methods, or participant demographics (e.g., age, ethnicity), thereby ensuring a broad and inclusive approach.

### Search Strategy

To identify potential papers, the literature search began with electronic database searches. Search terms included ‘student’ AND ‘athlete’ AND ‘burnout or burn-out’ AND ‘universit\* or colleg\*’, as well as all related search terms. The searches were conducted across four databases: SPORTDiscus, PsycInfo, PsycArticles, and PubMed. To ensure thoroughness, the reference lists of included studies were re-

viewed for additional relevant articles, and supplementary searches in Google Scholar using similar terms as well as its ‘Cited By’ function were conducted to identify any studies that may have been missed via database searches. This process occurred in October-November 2024 (see Figure 1 for PRISMA Flow Chart).

**Figure 1**  
*PRISMA 2020 Flow Chart Depicting the Identification, Screening, and Inclusion of Articles.*



Database search results were identified and organized in Excel spreadsheets during the data selection process. After manually removing duplicates, screening proceeded in three stages: title, abstract, and full-text reviews. During the title and abstract screening, studies that very clearly did not meet the inclusion criteria (e.g., examining unrelated topics) were excluded. The remaining articles deemed potentially relevant were then subjected to a detailed full-text screening. At this stage, additional studies identified through reference list screenings of potentially relevant articles were also evaluated for inclusion.

## Data Charting and Quality Assessment

Data charting was performed using Excel spreadsheets by two authors (SC, SA, or KW) for each paper following the pre-registered protocol.<sup>1</sup> Any discrepancies between authors during data charting were resolved through conversations with each other and the senior author (DM) until a consensus was reached. Data coding included: (1) the conceptualization(s) and measurement of athlete burnout; (2) theories or variables examined in relation to burnout; (3) research design (e.g., cross-sectional, longitudinal); and (4) study characteristics, including publication year, country, participant demographics (i.e., age, sex), type of sport(s) sampled, and summary of outcomes. Given the diversity of reported outcome variables, measures were grouped into similar themes to facilitate synthesis and reporting—these included demographic and personal characteristics, psychosocial states, and interpersonal factors (see Results section). Data charting was completed by March 2025. Consistent with guidance from Peters et al.'s (2021) suggestion that a quality appraisal tool/risk of bias assessment should not be used to compare across studies that are heterogenous in designs and outcomes, the quality of studies/risk of bias among studies included in the analysis was not examined.

## Results

### Search and Selection of Studies

A total of 115 studies were initially identified through electronic database searches, and was reduced to 109 after removing duplicates. Following two stages of filtering (title and abstract, full-text review), 18 studies met all inclusion and exclusion criteria for this scoping review. An additional eleven studies were included after screening reference lists, resulting in a total of 29 studies. A visualization of the study selection process, including reasons for exclusion during full-text screening, is presented in the PRISMA flow chart (Figure 1).

### Study Sample Demographics

The 29 studies included in this review represented 8,022 intercollegiate athletes. Sample sizes across the studies varied widely, ranging from as few as 8 participants (Dubuc-Charbonneau & Durand-Bush, 2015) up to 618 participants (Yang et al., 2024). Study sample demographics including mean years of age, participant sex, race, and region of study are reported in Table 1. Regarding participant sex, three studies exclusively sampled female participants (Gray et al., 2023; Holden et al., 2014; Mellano et al., 2022) and one exclusively sampled male participants (Grobbeelaar et al., 2011). Eleven studies reported participants' academic year, with first- and second-year students comprising 59.6% of the participant sample. One study provided details regarding participants' academic program of study (Dubuc-Charbonneau et al., 2014), and one study indicated participants were specifically part of the senior training squad (i.e., the primary group of athletes training to compete in an upcoming tournament; Grobbelaar et al., 2011).

**Table 1**  
*Demographic Variables Reported Across Study Samples*

Variable		Number of Studies Reporting	%
<b>Sex</b>	Female	28	54.5
	Male	26	45.5
<b>Race</b>	White/Caucasian	10	57.9 to 92.8
	Not Reported	19	65.5
<b>Region</b>	United States	15	51.7
	Taiwan	6	20.7
	Canada	4	13.8
	Korea	1	3.4
	China	1	3.4
	South Africa	1	3.4
	United Kingdom	1	3.4
<b>Number of Sports Sampled in Study</b>	Multiple Sports	25	86.2
	Single Sport	4	13.8
<b>Sport Type</b>	Basketball	18	62.1
	Track and Field	17	58.6
	Volleyball	14	48.3
	Swimming and Diving	11	37.9
	Soccer	10	34.5
	Softball	10	34.5
	Tennis	9	31.0
	Baseball	8	27.6
	Football	8	27.6
	Golf	7	24.1
	Gymnastics	7	24.1
	Cross-Country	6	20.7
	Ice Hockey	5	17.2

	Rowing	4	13.8
	Wrestling	4	13.8
	Rugby	1	3.4
	Martial Arts	1	3.4
		<b>Number of Studies Reporting</b>	<b><i>M</i><sub>Years</sub></b>
<b>Age</b>	Years of Age	28	20
<b>Sport Experience</b>	Years of Sport Experience	10	9.56

### Sport Context

The studies covered a wide range of individual and team sports. Most studies ( $n = 25$ ; 86.2%) sampled participants from multiple sports. One study did not specify which sport(s) participants played (Howard et al., 2022), whereas another broadly indicated participants were involved in either summer or winter sports (DeFreese & Smith, 2013). The type of sports study participants engaged in and their years of sport experience are reported in Table 1. Four studies focused exclusively on a single sport: volleyball (Schellenberg et al., 2013); rugby (Grobbelaar et al., 2011); and soccer (Chiou et al., 2020; Saward et al., 2024). Garinger et al. (2018) identified their sample consisted of track and field athletes; however, they noted some athletes were considered specialized (i.e., those who solely participated in track and field), whereas others were multiple-sport athletes (i.e., played sports at university outside track and field).

### Study Design

Most studies ( $n = 27$ ; 93.1%) employed a quantitative approach to examine athlete burnout in the intercollegiate athlete population. Among these, 22 studies (75.9%) adopted single-time point, cross-sectional designs, whereas five (17.2%) utilized longitudinal designs. The remaining two studies (Dubuc-Charbonneau & Durand-Bush, 2015; Saward et al., 2024) adopted a mixed-methods approach, incorporating some combination of questionnaires, one-to-one interviews, and focus group discussions.

### Conceptualization of Athlete Burnout

The most frequently used conceptualization of athlete burnout in this review comes from Raedeke and Smith (2001;  $n = 24$ ; 82.8%). Research generally supported this conceptualization, as evidenced by the three burnout subscales consistently being correlated with one another. Four studies (13.8%) were grounded in Smith's (1986) cognitive-affective model of burnout, which posits burnout involves a psychological, emotional, and (sometimes) physical withdrawal from engagement in a previously enjoyable activity due to excessive stress or dissatisfaction. The remaining study used Pines' (1993) conceptualization, which follows an existential view

of burnout (i.e., a proposed need to believe one's life is meaningful) in (non-sport) occupational environments. Athlete burnout was primarily measured using the Athlete Burnout Questionnaire (ABQ; Raedeke & Smith, 2001), with 27 studies (93.1%) employing this tool. The remaining two studies used either the Chinese version of the Eades Athlete Burnout Inventory (Chen et al., 2008) or the Maslach Burnout Inventory (Holden et al., 2014).

### Factors Associated with Athlete Burnout

After charting the data from studies in this scoping review, the variables examined in relation to intercollegiate athlete burnout were organized into four categories. These included *demographic influences* (e.g., sex, academic year), *personal characteristics* (e.g., perfectionism, grit), *psychosocial states* (e.g., motivation, resilience), and *interpersonal factors* (e.g., social support, coaching behaviors). The number of studies examining each of these categorized factors associated with burnout are summarized in Table 2.

**Table 2**  
*Factors Associated with Athlete Burnout*

<b>Factors associated with Athlete Burnout</b>	<b>Number of studies</b>	<b>%</b>
Demographic Variables (i.e., Sex, Academic-Related Variables, Sport Type, Injury History)	9	33.3
Personal Characteristics (i.e., Personality Traits, Affective Traits)	10	37.0
Psychosocial States (i.e., Positive Psychological Skills, Affective States, Self-Determined Motivation, Psychological Health and Well-Being, Coping)	15	55.6
Interpersonal Factors (i.e., Stress, Social Support, Coach-Athlete Relationship, Parenting Behaviors)	12	44.4

*Note:* Only the 27 quantitative studies are included in this table

### ***Demographic Influences***

The influence of several demographic variables on intercollegiate athlete burnout, including sex, academic variables, sport type, and injury history, was examined across 27 quantitative studies. Across all studies that explored the level of burnout based on sex ( $n = 5$ ), female intercollegiate athletes reported higher levels of athlete burnout than their male counterparts. Researchers found significantly higher levels of emotional and physical exhaustion among female athletes, although no significant effects emerged between sex and the ABQ subdimensions of sport devaluation and reduced sense of accomplishment (Dubuc-Charbonneau et al., 2014; Giusti et al., 2022). Notably, female athletes without any type of scholarship reported the highest levels of emotional and physical exhaustion, while males without scholarships reported the lowest levels (Judge et al., 2012).

The relationship between athlete burnout and academic variables was examined across three studies (11.1%), including year of eligibility, academic year, program, and scholarship status. One study noted no significant effects of university sport eligibility, academic year, or academic program on burnout levels (Dubuc-Charbonneau et al., 2014). However, another study found athletes further along in their athletic eligibility (i.e., in their third, fourth, or fifth year of eligibility) experienced significantly higher levels of sport devaluation than first- and second-year athletes (Giusti et al., 2022). Yet, no differences were found between years of eligibility for subscales of emotional and physical exhaustion or reduced sense of accomplishment (Giusti et al., 2022). The type of scholarship (none, academic, or athletic) influenced athletes' sense of accomplishment, with non-scholarship athletes reporting reduced athletic accomplishment compared to those with athletic scholarships (Judge et al., 2012). The same study found no significant effects of scholarship amount, scholarship type, sport, and academic year on the sport devaluation subdimension.

Six studies (22.2%) explored burnout in relation to various sport influences, including sport type and injury history. The relationship between sport type and burnout was somewhat inconsistent across studies. For instance, Dubuc-Charbonneau et al. (2014) reported athletes participating in basketball and swimming demonstrated higher emotional and physical exhaustion scores compared to those involved in hockey and fencing. Additionally, athletes in hockey and volleyball reported lower sport devaluation scores than those in fencing. However, no significant differences were observed among sports with respect to the reduced sense of accomplishment subdimension. In contrast, Holden et al. (2014) found basketball and volleyball athletes exhibited the highest levels of emotional exhaustion and diminished personal accomplishment compared to athletes from cross-country, soccer, softball, tennis, and track and field. Holmberg and Sheridan (2013) noted participating in track and field predicted a greater reduced sense of accomplishment compared to athletes participating in football, basketball, swimming, baseball, softball, and tennis. The variability in these findings may be due, in part, to the fact that Dubuc-Charbonneau et al. (2014) and Holmberg and Sheridan (2013) employed the ABQ to measure athlete burnout, whereas Holden et al. (2014) utilized the MBI. Injury history also appeared relevant, as athletes with previous injuries experienced a significantly reduced sense

of accomplishment compared to those with no history of injury (Giusti et al., 2022). Similarly, Holmberg and Sheridan (2013) identified injury status as a predictor of higher levels of emotional and physical exhaustion. Although specific sport experiences and individual demographics were found to relate to intercollegiate athlete burnout, researchers have also considered the importance of various personal characteristics, such as personality, that may make certain athletes more (or less) susceptible to experiencing burnout.

### ***Personal Characteristics***

Ten of the quantitative studies (37%) investigated the relationship between burnout and intercollegiate athletes' personal characteristics, broadly focusing on personality and affective traits. Seven studies (25.9%) examined the relationship between athlete burnout and personality traits, notably perfectionism and grit. More specifically, five of these (18.5%) explored the role of perfectionism, consistently finding that maladaptive perfectionism predicted higher levels of burnout, whereas adaptive perfectionism was associated with lower burnout levels (Chen et al., 2008). While exploring the relationship between perfectionistic cognitions and burnout at two time points over a three-month period, Crowell and Madigan (2022) found higher perfectionistic concerns correlated with a reduced sense of accomplishment and emotional exhaustion at both time points. Similarly, Garinger et al. (2018) reported both direct and indirect effects (via perceived stress) of perfectionistic concerns on burnout. In contrast, Gotwals (2011) observed athletes who were identified as healthy perfectionists scored lower across all burnout subscales. Among the two studies that explored the relationship between grit and intercollegiate athlete burnout, both Howard et al. (2022) and Gray et al. (2023) observed a negative effect wherein "grittier" athletes were less likely to experience burnout.

Four studies (14.8%) explored the relationship between athlete burnout and affective traits, including gratitude and passion. Researchers found that higher levels of trait (i.e., dispositional) gratitude were predictive of lower burnout (Gabana et al., 2017; Ruser et al., 2021). In one study, Yukhymenko-Lescroart et al. (2022) found participants with lower general and sport gratitude as well as lower coach-athlete relationship perceptions exhibited higher burnout scores across all three dimensions compared to participants with high general and sport gratitude and high coach-athlete relationship perceptions. Regarding passion, Schellenberg et al. (2013) found direct and indirect (via disengagement-oriented coping strategies) effects of obsessive passion on changes in burnout, but no significant effects were found for harmonious passion.

### ***Psychosocial States***

Across 15 studies, researchers examined the relationship between burnout and psychosocial variables broadly related to positive psychological skills, affective states, self-determined motivation, psychological health and well-being, and psychological coping. Three studies (11.1%) examined the relationship between burnout and psychological skills, including state (i.e., momentary) gratitude, resilience, and

goal attainment. Ruser et al. (2021) examined the relationship between burnout and gratitude, both as a trait (as discussed previously) and as a state, where gratitude was considered a skill that can be developed. The researchers found evidence for the importance of sport-specific state gratitude in predicting lower burnout scores on all three subscales (Ruser et al., 2021). Resilience, another psychological skill, was also found to be negatively correlated with athlete burnout, and lower resilience was predictive of higher burnout across several hierarchical regression analyses (Lu et al., 2016). Further, athletes who reported lower levels of goal attainment (i.e., self-perceptions of mastery, self-improvement, and performance) were more likely to have higher levels of burnout (Schellenberg et al., 2013).

Four studies (14.8%) considered affective states, including mental energy, mood state, and competitive anxiety, in relation to athlete burnout. Chiou et al. (2020) reported athletic mental energy was negatively correlated with athlete burnout. These scholars also found that mental energy moderated the stress-burnout relationship, such that athletes with low mental energy experienced greater burnout in response to increasing sport-specific stress. In addition, studies found that all three dimensions of competitive anxiety (somatic anxiety, worry, and concentration disruption) were positively correlated with burnout. Specifically, Yang et al. (2024) found that all three dimensions of athlete burnout were related to competitive anxiety, but Cho et al. (2019) only reported correlations between competitive anxiety and physical and emotional exhaustion and sport devaluation. In line with significant correlational findings, both Cho et al. (2019) and Yang et al. (2024) found direct effects of competitive anxiety on higher overall burnout in athletes. Lastly, Grobbelaar et al. (2011) examined the relationship between athlete burnout and mood states over five months. Researchers found emotional exhaustion was the only burnout subscale to yield significant changes across time points. Vigor (i.e., enthusiasm and mental alertness) was inversely correlated with athlete burnout, while significant, positive relationships were found between burnout and the remaining five negative mood state subscales (tension, depressive mood, anger, fatigue, confusion).

Three studies (11.1%) examined the relationship between burnout and self-determined motivation. Guided by self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), researchers found athletes who reported higher levels of burnout were more likely to report lower levels of motivation (DeFreese & Smith, 2013). More specifically, Holmberg and Sheridan (2013) found all three subscales of burnout were negatively correlated with intrinsic motivation, integrated motivation, and identified regulation, and positively correlated with introjected regulation, external regulation, and amotivation. In other words, the more self-determined athletes were in their motivation, the less likely they were to experience athlete burnout (and vice versa). Lastly, Yang et al. (2024) examined the relationship between burnout and psychological needs satisfaction. The researchers found that all three subscales of burnout were negatively correlated with athlete autonomy, competence, and relatedness, with the largest effects found between needs satisfaction and emotional and physical exhaustion.

Among the studies that examined the relationship between burnout and athletes' psychological health and well-being ( $n = 3$ ), athletes who reported greater well-being (DeFreese & Smith, 2014) and satisfaction with their sport (Gabana et al., 2017) were less likely to experience burnout. Further, athletes who reported higher symptoms of depression, anxiety, and stress were more likely to experience burnout, with mental health symptoms also being predictive of burnout scores (Howard et al., 2022).

Lastly, two studies (10.5%) examined the relationship between psychological coping and athlete burnout, including negative thoughts and avoidance coping. Researchers found athletes were more likely to report higher burnout when they had more negative thoughts (e.g., negative self-concept, helplessness; Chang et al., 2017). In addition, burnout was negatively associated with greater use of avoidance coping behaviors (Pacewicz et al., 2018).

### ***Interpersonal Factors***

Twelve of the quantitative studies (44.4%) examined the relationship between athlete burnout and various interpersonal variables, including stress, social support, the coach-athlete relationship, and parenting behaviors. Of the studies examining stress (sport-specific and general stress), positive correlations were found between the experience of stress and intercollegiate athlete burnout, regardless of the type of stress considered (Chang et al., 2017; Chiou et al., 2020; Chyi et al., 2018; Garinger et al., 2018). However, three of these studies measured both sport-specific stress and general stress, wherein sport-specific stress tended to be more strongly related to burnout than general stress (Chang et al., 2017; Chiou et al., 2020; Chyi et al., 2018). Only one study considered mediating and moderating effects within the stress-burnout relationship. These authors reported perceived distress partially mediated the relationship between life stress (encompassing both sport-specific and general stress) and burnout, though these effects were very small (Chyi et al., 2018). Conversely, counter-stress (defined by the authors as one's confidence in their ability to cope with challenges they encounter) was only found to moderate the relationship between general stress (but not sport-specific stress) and burnout.

The relationship between social support and athlete burnout was explored in four of the 27 quantitative studies (14.8%). Three of the studies (11.1%) examined general perceptions of social support, revealing a significant inverse relationship with burnout, where higher perceptions of social support were associated with fewer symptoms of burnout (DeFreese & Smith, 2013, 2014; Gabana et al., 2017). Within the sub-dimensions of burnout, greater social support was inversely associated with reduced sense of accomplishment and devaluation (DeFreese & Smith, 2013, 2014). A similar relationship was found between social support and exhaustion in DeFreese and Smith's 2014 study, but not their 2013 study. Perceived social support was also found to mediate the relationship between gratitude and burnout (Gabana et al., 2017). The remaining study (Lu et al., 2016) explored three specific types of social support: informational, esteem, and tangible support. All types of support

were negative predictors of burnout, with tangible support demonstrating the largest relationship (Lu et al., 2016).

Whereas some studies investigated social support quite broadly, four studies (14.8%) examined the specific influence of coach relationships and behaviors on intercollegiate athlete burnout. In two studies (Chang et al., 2018; Cho et al., 2019), autonomy-supportive coaching was negatively correlated with overall burnout scores as well as each of the subdimensions of burnout. Mellano et al. (2022) also showed lower autonomy-supportive coaching behaviors were positively related to athlete burnout. Controlling coaching behaviors had a positive relationship with burnout (Cho et al., 2019). Punishment-oriented feedback from coaches was also found to be positively related to the subdimension of physical and emotional exhaustion in collegiate athletes (Mellano et al., 2022). Finally, positive coach-athlete relationships were associated with reduced burnout (Ruser et al., 2021).

One study examined the relationship between burnout and parenting behaviors (Howard et al., 2022). Those researchers found a significant positive relationship between athlete burnout and ‘helicopter’ parenting (i.e., over-involved, autonomy-restricting) behaviors for male, but not female, athletes. A negative relationship between burnout and autonomy-granting parenting behaviors (for both male and female athletes) was also evident. Moreover, an exploratory analysis revealed the positive relationship between overparenting behaviors and burnout was mediated in part by decreased grit and decreased mental health outcomes.

## Discussion

The purpose of this scoping review was to describe the current state of the burnout literature, specifically in relation to intercollegiate athletes. A total of 29 studies were identified, with results synthesized based on demographic influences, study characteristics, and the factors associated with burnout in this population. In this section, we reflect on these findings, highlight limitations of the study as well as gaps in the literature, and provide recommendations for future research.

### **With Whom has the Research been Conducted?**

Several studies included in this review examined various demographic factors associated with burnout in intercollegiate athletes. Among the five studies that examined sex as a potential factor, all studies reported female athletes were at greater risk of experiencing high levels of emotional and physical exhaustion compared to their male counterparts (Dubuc-Charbonneau et al., 2014; Giusti et al., 2022; Judge et al., 2012). While the studies included in this review point to potential sex differences in burnout, the underlying mechanisms (e.g., biological, social, psychological) that may explain these differences were not examined. In addition to sex, two studies examined the effects of injury on intercollegiate athlete burnout and found that both having a current injury (Holmberg & Sheridan, 2013) as well as a history of injuries (Giusti et al., 2022) were predictive of higher intercollegiate athlete

burnout compared to those who had no past or present injuries. Notably, pediatricians have called for increased awareness regarding how high volumes of sport training in youth sport can lead to overtraining, overuse injuries, and burnout among youth athletes (Difiori et al., 2014). Yet, it is not known to what extent athletes' training volume *prior* to intercollegiate sport may impact athletes' likelihood of future injury or burnout over the course of their time at a university. Temporary breaks from sports due to injury may initially reduce burnout, but cumulative injuries could ultimately lead to diminished enjoyment and increased burnout risk (Chyi et al., 2018; Giusti et al., 2022). Moving forward, it would be prudent to examine the long-term effects of training volume and injury on burnout, and potential points for intervening with increased support over the course of a season or across an athlete's intercollegiate career.

One of the initial (a priori) considerations for conducting this review was to examine the unique factors intercollegiate athletes may experience (as part of their dual-role) compared to elite professional athletes (who are exclusively focused on sport as their job), or other non-athletic (single-role) university students. Ultimately, we were precluded from conducting such an examination due to the scant amount of research that included variables which could distinguish between these populations. For instance, it would be useful to examine potential differences between athletes and non-athletes at university in terms of the relationships between burnout and various academic variables such as course load (i.e., number of enrolled courses), access to academic supports, and hours spent studying. Such research would help elucidate how intercollegiate athletes' unique demands may impact their susceptibility to burnout (and salient correlates such as mental [ill] health). Those efforts would also shed light on possible moderators that might decrease the potential for burnout amongst intercollegiate athletes; for example, if intercollegiate athletes are at increased risk of experiencing burnout relative to their non-athlete counterparts, perhaps those risks can be reduced or eliminated if a high level of academic supports are available.

It is worth noting our sample included athletes attending university/college across several countries, with the most frequent regions being the United States, Taiwan, and Canada. It is conceivable that experiences of burnout among intercollegiate athletes could differ across countries due to factors related to financial supports, academic supports, or cultural norms. Although we sought to explore the impact of various potential sources of burnout, neither academic-related factors nor cultural aspects were sufficiently captured in the data. In order to examine the potential impact of cultural differences, future work should include cross-cultural comparisons of intercollegiate athletes, as well as more in-depth examinations of burnout (via qualitative study designs) to capture athletes' experiences across contexts.

Among the (limited) studies that did capture academic-related factors, two studies examined the potential impact of academic year on intercollegiate athlete burnout, with mixed findings emerging. Specifically, Dubuc-Charbonneau et al. (2014) found no effect of years of study on any of the three burnout subscales. However, Giusti et al. (2022) found athletes later in their collegiate careers (i.e., third, fourth,

and fifth years of eligibility) reported greater sport devaluation compared to athletes in their earlier years. The latter finding aligns with a proposed ‘burnout continuum’, which suggests exhaustion initiates the burnout process, followed by reduced accomplishment, and eventual sport devaluation (Giusti et al., 2022). In other words, it may be an accumulation of emotional and physical exhaustion, as well as reduced accomplishment, over several years as an intercollegiate athlete, that culminates as sport devaluation in later years. Given the limited work to date (with mixed findings), the potential burnout continuum and effects of years of university sport on burnout in intercollegiate athletes should be interpreted with caution. Additional research examining burnout—including its three dimensions—over time in this population, would offer further insight into these potential nuances and thereby enhance our understanding of how intercollegiate athletes can be best supported throughout their time at a university.

### **How has this Research been Conducted?**

Research on burnout in intercollegiate athletes has traditionally employed cross-sectional designs, prompting calls for longitudinal studies to better understand the evolution of burnout over time (e.g., Gould & Whitley, 2009). Despite such calls, only 17.2% of studies in our review used a longitudinal design (Chang et al., 2018; Crowell & Madigan, 2022; DeFreese & Smith, 2014; Grobbelaar et al., 2011; Mellano et al., 2022). The remaining designs were either cross-sectional (75.9%) or incorporated mixed methods (6.9%). Overall, the findings from the current review reiterate the need for longitudinal studies (e.g., across an academic year and/or sport season) to clarify the development of burnout, potential protective factors, and critical periods for intervention. This longitudinal work could include examining the extent to which intercollegiate athletes’ experiences of burnout may emerge from previous experiences in sport (e.g., high school sport) and/or extend *beyond* their time in university/college and continue into their professional careers (among those who become professional athletes, post-graduation). Relatedly, the distinct absence of qualitative research limits our understanding of the subjective experiences of burnout in collegiate athletes. Indeed, qualitative insights could help clarify the complexity of burnout and the potential factors impacting intercollegiate athletes’ experiences of burnout (particularly if these qualitative studies are conducted at multiple points in time).

Beyond the observational designs highlighted above, a limited number of intervention studies have tested how burnout could be prevented or managed among intercollegiate athletes. Considering this paucity of work, we can perhaps draw from research in other contexts or populations to inform our understanding of the potential design and effects of such interventions. For instance, in a systematic review and meta-analysis, Panagioti et al. (2017) found interventions delivered to medical physicians resulted in small, significant reductions in burnout. The interventions varied in content but included techniques such as mindfulness-based stress reduction training, or educational interventions designed to increase self-confidence, communication skills, and/or exercise. Among athletes, meta-analytic evidence also supports mind-

fulness interventions in decreasing athlete burnout (Li et al., 2019). Similar interventions may therefore be useful in the prevention or treatment of burnout among the intercollegiate athlete population, although it should be noted that (a) only a small number of mindfulness-based burnout interventions have been conducted to date, and (b) the effects of these interventions compared to other burnout-management strategies are unclear. Taken together, whilst recognizing the increased feasibility challenges in conducting longer-term studies and intervention research, moving beyond cross-sectional designs and towards designs that better capture changes in burnout would enable researchers and stakeholders to better understand the extent to which burnout can be prevented or reduced among intercollegiate athletes over time.

### **What Factors are Associated with Burnout?**

Our analysis of research on intercollegiate athletes revealed various personal, psychosocial, and interpersonal factors impacted burnout. The personal trait that has received the most research attention to date (five studies) is perfectionism (Chen et al., 2008; Crowell & Madigan, 2022; Garinger et al., 2018; Gotwals, 2011; Pacewicz et al., 2018). Intercollegiate athletes who report more problematic forms of perfectionism (e.g., perfectionistic concerns, maladaptive perfectionism) appear more likely to experience burnout compared to athletes with more positive forms of perfectionism (e.g., perfectionistic strivings, adaptive perfectionism). This aligns with findings from Hill and Curran's (2015) meta-analysis on perfectionism and burnout across sport, work, and education domains. Those authors found perfectionistic concerns were positively associated with burnout, with medium-to-large effects (Hill & Curran, 2015). In addition to heightened levels of perfectionistic concerns predicting higher burnout (Garinger et al., 2018), athletes with higher levels of perfectionistic concerns also seem more likely to report stigma towards sport psychology services and were less open to seeking support from mental health practitioners (Watson et al., 2021). Such a hesitation to access psychological supports is an important consideration for coaches, practitioners, and stakeholders to understand burnout among athletes.

Given the apparent relationship between burnout and perfectionism, researchers have tested the effects of interventions aimed at changing perfectionistic traits. However, the benefits of such programs have been rather meagre. For example, in a three-month intervention, psychological skills training was ineffective in changing perfectionistic traits (Watson et al., 2023). This is perhaps unsurprising considering traits are more stable (i.e., less mutable) than psychological states. As such, it may be worthwhile to target psychological states (rather than traits) in future intervention work. For example, intercollegiate athletes with greater levels of gratitude reported lower levels of burnout compared to those with lower gratitude (Ruser et al., 2021; Yukhymenko-Lescroart et al., 2022). Considering those findings along with meta-analytic evidence supporting the effectiveness of gratitude interventions on various psychological outcomes (e.g., subsequent gratitude engagement, psychological well-being; Davis et al., 2016), gratitude-training interventions could be worth examining as a potential avenue to reduce the occurrence or adverse effects of burnout. It may also be prudent to examine other constructs that have been found to be malleable

through intervention and beneficial to psychological outcomes related to burnout, but (to our knowledge) these topics have not yet been studied within the intercollegiate population. For example, meta-analytic reviews have shown self-compassion interventions can improve a range of psychological outcomes associated with burnout, such as mindfulness, stress perceptions, and anxiety (Ferrari et al., 2019). Such findings, along with evidence from non-intercollegiate sport contexts demonstrating an inverse relationship between burnout and self-compassion (e.g., Hashem & Zeinoun, 2020), hint at the value of testing the effects of self-compassion as a potential antidote to intercollegiate athlete burnout.

From a theoretical perspective, it is worth highlighting that several studies in this review examined burnout through self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) and found intercollegiate athletes who were more self-determined in their motivation and who reported higher basic needs satisfaction (i.e., autonomy, relatedness, and competence) were less likely to experience burnout in sport. These findings align with other reviews conducted in sport, including Li et al.'s (2013) meta-analysis, which reported medium-to-large effects for both basic needs satisfaction and self-determined motivation in predicting lower burnout scores. These findings are also consistent with a systematic review of burnout in team sports, which found significant negative associations between burnout and autonomy, competence, relatedness, and self-determined motivation, as well as negative associations for amotivation and burnout (Woods et al., 2025). Given this, it appears self-determination theory may serve as a useful backdrop to examine burnout among intercollegiate athletes.

Research has also focused specifically on the relationships between stress and burnout amongst intercollegiate athletes. Consistent with findings from Lin et al. (2021)'s meta-analysis, stress was shown to be significantly positively related to burnout across several studies (Chang et al., 2017; Chiou et al., 2020; Lu et al., 2016). In the current review, a limited number of studies considered stressors that may *uniquely* impact intercollegiate athletes (that is, relative to non-athlete students), which is a notable gap in the current burnout literature. For example, researchers should consider stressors such as academic stress (i.e., balancing coursework and training load), financial stress (e.g., income, maintenance of academic and/or sport scholarships), days of absence from courses due to sport-related travel (i.e., for training camps, competitions), and perceived importance of grades. These variables have the potential to play a meaningful role in intercollegiate athletes' experiences of stress and thus may have implications for burnout beyond sport-specific stressors. Researchers in the future could address this gap by considering both sport and academic stress as *distinct* factors in relation to intercollegiate athlete burnout.

On the topic of stress, it should be noted that researchers should not solely examine the level of *stressors* themselves when studying burnout in intercollegiate athletes; rather, the *appraisals* of those stressors and potential *coping strategies* enacted in response also need to be considered (cf. Lazarus, 1985, 2000). Indeed, Lu et al. (2016) found that when athletes were under high stress, they were less susceptible to burnout if they had developed more resilience and received greater coach support. These findings also align with those from Sorkkila et al. (2019), who found resilience

among secondary school student-athletes may act as a protective factor against burnout over time. Furthermore, Chang et al. (2017) found the extent to which athletes reported having negative thoughts (e.g., negative self-concept, feelings of helplessness) mediated the effects of stress on burnout. These findings can be understood through the lens of Lazarus' model of stress and coping (Lazarus, 1985, 2000), wherein the interpretation of a stressful event and subsequent appraisal of one's ability to cope with the source of stress leads to the experience of stress itself. In this sense, rather than simply aiming to reduce stress altogether, it may be athletes who have a better ability to manage stress (e.g., engaging in adaptive coping strategies, receiving social support) are more protected against burnout. Indeed, a meta-analysis by Wilczyńska et al. (2022) examined five randomized-controlled psychological skills interventions with young athletes (under 25 years old) and found interventions were effective at reducing burnout in sport. Future research is warranted to understand the extent to which similar benefits emerge for intercollegiate athletes specifically.

The role of important sources of social support was also examined in their relation to intercollegiate athlete burnout. Firstly, regarding coaches, greater autonomy-supportive coaching behaviors (Chang et al., 2018; Cho et al., 2019; Mellano et al., 2022) and more positive coach-athlete relationships (Ruser et al., 2021) were found to be associated with lower burnout scores, whereas controlling coaching behaviors were related to greater burnout scores (Cho et al., 2019). Further, Lu et al. (2016) found various specific forms of a coach's social support (i.e., tangible, informational, esteem) were related to lower athlete burnout. Beyond coaches, mixed effects were found in terms of perceived social support from others (e.g., parents, teammates). Specifically, and in line with findings from others (Pacewicz et al., 2019; Woods et al., 2025), several studies in this review reported a negative correlation of burnout with general perceptions of social support (Gabana et al., 2017) as well as support specifically from teammates (DeFreese & Smith, 2013, 2014). However, when tested longitudinally over a sport season, no predictive effects of perceived social support from teammates on athlete burnout were found (DeFreese & Smith, 2013). Similarly, autonomy-supportive parenting was related to lower burnout, whereas overparenting behaviors were related to greater burnout in intercollegiate athletes, but these effects did not hold when examined as predictors via structural equation modelling (Howard et al., 2022). These findings underscore the importance of longitudinal designs and/or more sophisticated analyses (beyond cross-sectional correlations) to fully appreciate the role of a supportive environment in mitigating athlete burnout among intercollegiate athletes.

### **Limitations and Additional Future Research Directions**

Balanced against the strengths of this review, limitations should also be noted. As highlighted previously, most included studies were cross-sectional, and thus, are only able to capture a snapshot of the experiences of burnout (i.e., a single point in time). This presents important limitations to the representativeness and generalizability of the findings. Among those cross-sectional studies, many only included correlational analyses to examine the relationship between burnout and variables of

interest; thus, we are unable to confidently ascertain *directionality* in this review. In line with suggestions from others (Dubuc-Charbonneau & Durand-Bush, 2015; Saward et al., 2024), future work should specifically examine directionality (e.g., via cross-lagged panel modelling; Mackinnon et al., 2022), as well as the *causal* mechanisms of burnout through randomized controlled interventions. As one example, Tóth-Király et al. (2021) collected data from young adults across nearly 15 years (beginning at ages 17-18) and found a bidirectional relationship between depression and burnout over time. In other words, depression was found to impact burnout, and burnout also impacted subsequent depression. It should also be noted that some studies in this review did not primarily focus on burnout but instead explored related constructs, such as teammate social support (DeFreese & Smith, 2013), negative social interactions (DeFreese & Smith, 2014), parenting behaviors (Howard et al., 2022), gratitude and coach-athlete relationships (Ruser et al., 2021), and passion and coping mechanisms (Schellenberg et al., 2013). Although these studies included measures of burnout among intercollegiate athletes, the study designs and statistical analyses were designed for non-burnout-related objectives, which warrants some caution around making interpretations specific to intercollegiate athlete burnout. The lack of focus on burnout specifically, at least among some studies, may have also contributed to the limited consideration of burnout sources that would be unique to intercollegiate athletes (i.e., academic-related factors).

Beyond the general limitations of the reviewed studies, the limitations of our study design should also be highlighted. For one, although the specific type of review we chose (a scoping review) was deemed most appropriate for addressing our research aims, we recognize those aims and the associated inclusion criteria were rather broad. While this helped ensure comprehensive coverage of the research to date on intercollegiate athlete burnout, it resulted in our results being rather descriptive. As part of this, we were unable to derive synthesized statistics that may be useful for readers, such as effect sizes or statistical significance of relationships between burnout and various correlates. Moreover, considering the range of study designs in our review, it was not deemed feasible to conduct a quality appraisal analysis of the studies we reviewed. Although such an absence is typical of scoping reviews (Sabiston et al., 2022), it nonetheless limits our ability to comment on the methodological quality of research in this area to date. We also recognize there may be studies that are relevant to the topic of burnout amongst intercollegiate athletes but were not included in our review due to our eligibility criteria (e.g., constraints around retrieving papers not written in English) or other factors such as publication bias (i.e., there may be studies that have not been published due to a lack of statistically significant findings).

## Conclusion

This scoping review highlights the progress and key gaps in understanding athlete burnout among intercollegiate athletes. Whereas much of the existing literature on athlete burnout has focused on elite youth and professional athletes, we sought to specifically examine the experience of burnout in this population. In this way, the

review contributes to knowledge in terms of the individuals who participated in this research, the methods by which the phenomenon has been studied, and the factors that affect the development and outcomes of intercollegiate athlete burnout. Specifically, the studies in this review predominantly employed quantitative methods, with data collected at a single time-point. Although relationships between burnout and several demographic factors (i.e., personal, psychosocial, and interpersonal) were examined, the findings were unable to ascertain the *directionality* of the relationships. Moving forward, our hope is the various avenues for future research that have been proposed—such as utilizing longitudinal methods to examine the development of burnout over time or examining the potential impact of academic and cross-cultural factors on experiences of burnout—will lead to subsequent studies that further our understanding of the nuances of burnout among intercollegiate athletes and, ultimately, help stakeholders develop appropriate strategies that foster the wellness of these individuals.

### Authors' Note

<sup>1</sup>The Open Science Framework (OSF) page for this study can be found here: <https://osf.io/vp7sq>

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### \* Indicates study was included as part of the scoping review

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## Appendix A: Preferred Reporting Items for Systematic reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
<b>TITLE</b>			
Title	1	Identify the report as a scoping review.	400
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	400
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	401-402
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	402
<b>METHODS</b>			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	403
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	403
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	403-404
Search	8	Present the full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	403-404

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	403-404
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	405
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	405 and Footnote 1
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	405
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	405
<b>RESULTS</b>			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	405 and Figure 1
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Footnote 1
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	n/a
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Footnote 1

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	405-413
<b>DISCUSSION</b>			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	413-419
Limitations	20	Discuss the limitations of the scoping review process.	418-419
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	419-420
<b>FUNDING</b>			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	n/a