



Burnout syndrome and coping strategies in athletes with disabilities: a systematic review

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Abstract

This systematic review aimed to synthesize the literature on burnout and coping in athletes with disabilities and identify the psychological and physical variables associated with burnout and coping in this population. The present study was conducted in accordance with the updated PRISMA 2020 systematic review guidelines. The Scopus, PubMed/Medline, PsycINFO, SciELO, Web of Science, and Google Scholar databases were searched. Eight articles were included in the study. Five of them investigated coping, and three investigated burnout. Their sample sizes ranged between 10 and 209 athletes with a total of 588 from the eight studies. Burnout was associated with socially prescribed perfectionism and sleep, and coping was associated with self-determined motivation, engagement, anxiety, depression, performance, and classification. This is the first systematic review of burnout and coping in athletes with disabilities that provides an overview of the studies conducted. Scientific research on the psychological constructs of coping and burnout in athletes with disabilities is in an incipient phase. The results highlight the key factors associated with burnout and coping in this population, which may inform targeted intervention strategies.

Keywords Athletes with disabilities · Motivation · Perfectionism · Sleep · Classification · Paralympic sport

Introduction

Sports for people with disabilities provides a healthy lifestyle and the opportunity to engage in high-performance sports (Cardoso et al., 2019). However, Paralympic sports may include some sources of stress, such as chronic pain and difficulty identifying whether the discomfort is caused by disability, sports injury or overtraining (Swartz et al., 2019). Other factors, such as the team's lack of knowledge about the athlete's disability (Campbell & Jones, 2002) and inadequate locations for training and competition (Arnold et al., 2016), can also be considered sources of stress. The Paralympic sports classification system is fundamental because it seeks equity in competition between people with various disabilities, but this classification process may be controversial (Barbosa et al., 2021; Dornick & Spencer, 2020) or even harmful in certain situations, for example, when disabled athletes and/or their teams consider that his classification is wrong (Arnold et al., 2016).

When stress becomes chronic in the face of these various stressors, it can cause burnout (Goodger et al., 2007). Athlete burnout is a psychophysiological syndrome with

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a dysfunctional condition characterized by three dimensions: physical and emotional exhaustion, reduced sense of sport performance, and sport devaluation (Gustafsson et al., 2011). Burnout syndrome leads to a series of negative psychophysiological and behavioral consequences (Gustafsson et al., 2017), such as impaired attention (Ryu et al., 2015), decreased performance, abandonment of sports (Isoard-Gautheur et al., 2016), and sleep problems (Gerber et al., 2018). Burnout symptoms can be avoided by the use of coping strategies (da Silva et al., 2021).

Coping is defined as a continuous effort through thought and action to deal with situations considered relevant and stressful (Lazarus, 1993, 2000). Coping strategies can be focused on the problem, when they manage or eliminate stress, or on emotion, when they regulate the emotional responses caused by stress (Lazarus & Folkman, 1987; Nicholls et al., 2016b). The periods of training and competition in sports put athletes under physical and psychological stress (Madigan et al., 2018). Therefore, coping strategies are important in a sports environment because they can reduce or prevent chronic stress (Madigan et al., 2020), positively impact performance, influence athlete satisfaction (Nicholls & Polman, 2007), and make athletes less vulnerable to burnout (da Silva et al., 2021; Goodger et al., 2007).

Research on the sports development of athletes with disabilities is still incipient (Dehghansai et al., 2017). Despite the recent growth in research on sports psychology in the Paralympic context (Martin, 2017), there is a gap in the sports psychology literature concerning athletes with disabilities (Kathleen & Smith, 2018). Particularly, there is a scarcity of research encompassing a comprehensive review of the literature about burnout, coping strategies, and the variables that exhibit physical and psychological relationships with these aspects among athletes with disabilities. The relevance of investigating psychological aspects is evident because athletes with disability consider psychological attributes, including coping strategies, essential for sporting success (Burns et al., 2019).

Although one systematic review has aimed at reviewing the psychosocial aspects and well-being of athletes with disabilities (Jefferies et al., 2012), this review was conducted out more than a decade and did not address burnout. In addition, no systematic review has investigated more specific psychological constructs such as burnout and coping in athletes with disabilities, which shows a gap in the literature for variables that may affect athlete performance and health. The systematic reviews conducted do not include available studies with athletes with disabilities or partially include studies available in the literature for burnout (e.g., Bicalho & Costa, 2018; Woods et al., 2022) and coping (e.g., Nicholls & Polman, 2007; Simpson et al., 2021).

In order to fill this gap, this systematic review had the following aims: a) to synthesize the literature on burnout

and coping in athletes with disabilities and b) to identify the psychological and physical variables associated with burnout and coping in this population. With these data, we intend to answer two questions: a) What scientific research has been done on burnout and coping in athletes with disabilities? and b) Which psychological and physical variables are associated with burnout and coping in athletes with disabilities?

Method

The PEO strategy was used to structure the questions and search strategy (Munn et al., 2018), where the three components are represented by population = athletes with disabilities without age and sex restriction, exposure = measurement of burnout and coping in athletes with disabilities using psychometric instruments, and outcome = relationships of psychological and physical variables with burnout and coping. The present study was also reported according to the updated Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021). This systematic review is registered in the International Prospective Register of Systematic Reviews (PROSPERO) system under protocol number CRD42021278634.

Search strategy

Searches were conducted on February 16th, 2022, in the databases Scopus, PubMed/Medline (biomedical literature), PsycINFO (psychological science), and SciELO (the Americas) for studies done in the areas of health, psychology, psychiatry, social science and different areas of knowledge. An updated search was performed on May 19th, 2023, with the inclusion of the Web of Science and Google Scholar databases. The searches were limited to the title, abstract, and keywords of the articles, using the following search strategy: (“ para athlete” OR para-athlete OR “ athletes with disabilities” OR “ athletes with disability” OR “ disability sport” OR “ sports for the disabled” OR “ paralympic sport”) AND (burnout OR burning OR coping OR cope), without restrictions on language or year of publication. Articles that investigated burnout and/or coping in athletes with disabilities, without age or sex restriction and with cross-sectional or longitudinal designs and interventions were included. In the opposite way, articles that investigated athletes without disabilities, people with disabilities who were not described in the study as athletes with disability in a Paralympic modality or adapted sport (e.g., amputee patients, people with spinal cord injury undergoing rehabilitation) were excluded. The exclusion criteria also reached case studies, narrative reviews, scope reviews, systematic reviews, book chapters, letters to the editor, summaries of conferences, master’s dissertations, and doctoral theses. In

addition, qualitative studies were also excluded because they did not test hypotheses. Finally, mixed-methods studies were excluded because they included different quantitative and qualitative approaches, making it difficult to synthesize results and assess the risk of bias, as well as they could increase the heterogeneity of the included studies.

Selection of the included studies

The processes of identification and selection of relevant articles were performed by two independent judges (FR and GJ). In the case of disagreement, a consensus meeting was held with the participation of a third judge (PD), a specialist in the field of sports psychology. The two independent judges initially analyzed the titles, abstracts, and keywords of all articles and removed duplicates using Web Rayyan software (Ouzzani et al., 2016), and a manual check was performed later. Articles were excluded because of the theme (e.g., Cardoso et al., 2020); the type of study (e.g., Caddick & Smith, 2014); the type of sample (e.g., Tanna et al., 2017); and the study design (e.g., Machida et al., 2013). The articles that remained were fully analyzed and included in the sample for analysis. After we read the full articles deemed eligible for the study, we searched their references, which yielded one more study for inclusion (Ho et al., 2015).

Data extraction

The judges who participated in the article selection step worked independently to extract the relevant data from the articles included. A consensus meeting was held with the participation of a third judge (PD) in case of disagreement between the two evaluators (FR and GJ). The following information was extracted from the articles: 1) names of the authors and year of publication; 2) country of publication; 3) study objective; 4) type of study; 5) sport modality; 6) sample; 7) type of disability; 8) psychometric instrument used; and 8) main results.

Assessment of risk of bias

The Joanna Briggs Institute (JBI) critical assessment verification tools were used to assess the risk of bias in all included studies (Munn, 2020). The responses of the tools could be “yes”, “no”, “not clear”, and “not applicable”. Two reviewers (FR and GJ) independently assessed the risk of bias, and the same process used in the previous steps was followed to resolve any differences between the reviewers.

Cross-sectional studies were evaluated using a tool with eight items, which assess 1) inclusion criteria; 2) description of the subjects and the study environment; 3) validity of the exposure measure; 4) condition measurement; 5) confounding factors; 6) results; and 7) statistical analysis

(Moola et al., 2020). Articles with scores > 7 are considered to have a low risk of bias, scores from 5 to 7 to have a moderate risk of bias, and scores ≤ 4 to have a high risk of bias (Souza et al., 2022).

For longitudinal studies, a tool with 11 items was used, which evaluate: 1) sample and population; 2) exposure measures for the sample; 3) validity of the exposure measure; 4) confounding factors; 5) results; 6) time of intervention; 7) follow-up; and 8) statistical analysis (Moola et al., 2020). Articles with scores ≥ 8 show a low risk of bias, scores 6 to 7 a moderate risk of bias, and scores ≤ 5 a high risk of bias (Brandt et al., 2020).

Finally, randomized controlled trials were scored using a tool with 13 items that evaluated 1) randomization; 2) concealment of allocation to treatment groups and similarity at baseline; 3) participants; 4) blinding of treatment administrators and evaluators; 5) treatment groups; 6) monitoring of the groups; 7) results; 8) statistical analysis; and 9) study design (Tufanaru et al., 2020). Articles with scores ≥ 8 show a low risk of bias, 6 to 7 a moderate risk of bias, and ≤ 5 a high risk of bias (John et al., 2020).

Results

Study selection

Figure 1 shows the number of articles present in each stage of the selection of the articles for inclusion. The sum of results from the six databases, 157 articles were identified, 25 of which were duplicates. After the exclusion of duplicates, 132 articles had their titles, abstracts, and keywords analyzed. Of these articles, 81 were excluded because they were out of topic, 31 were excluded because of the type of study, eight were excluded because of the type of sample, and five were excluded because of study design. This left seven articles to be read in full (Li et al., 2018; Martin & Malone, 2013; Ofoegbu et al., 2020; Perreault & Vallerand, 2007; Szájer et al., 2019; Turoń-Skrzypińska et al., 2020; Urbański et al., 2022), and one article was included from scanning their references (Ho et al., 2015). Finally, eight articles were included in the study.

Study characteristics

The main characteristics (author and year of publication, objective, type of study, modality, sample, type of disability, instrument used, and main results) of the articles included in the final analysis are shown in Table 1. Of the eight studies in this review, five investigated coping (Martin & Malone, 2013; Perreault & Vallerand, 2007; Szájer et al., 2019; Turoń-Skrzypińska et al., 2020; Urbański et al., 2022) and three investigated burnout (Ho et al., 2015; Li et al.,

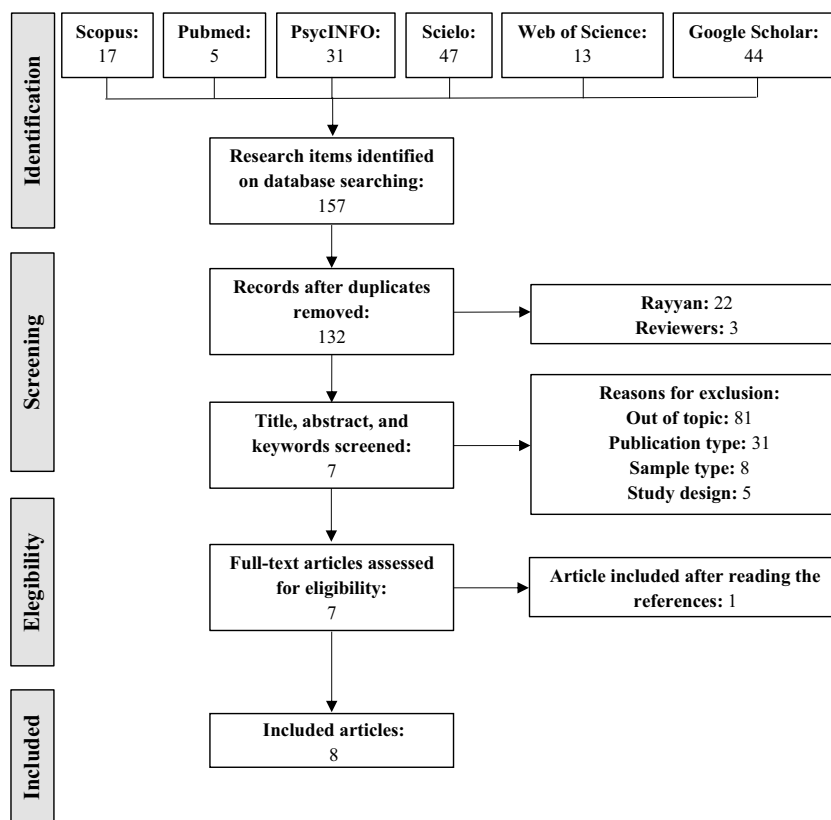


Fig. 1 PRISMA flow diagram of the articles selected for analysis

2018; Ofoegbu et al., 2020). Regarding the study design, five studies had a cross-sectional design (Ho et al., 2015; Martin & Malone, 2013; Perreault & Vallerand, 2007; Szájer et al., 2019; Turoń-Skrzypińska et al., 2020), two studies had a longitudinal design (Li et al., 2018; Urbański et al., 2022), and one study was a randomized controlled clinical trial (Ofoegbu et al., 2020). The total sample of the eight studies was 588 athletes, of both genders. The number of athletes with disabilities in the studies ranged from 10 to 209, and most studies ($n = 5$) had samples smaller than 50 participants (Li et al., 2018; Martin & Malone, 2013; Perreault & Vallerand, 2007; Szájer et al., 2019; Turoń-Skrzypińska et al., 2020). The types of disabilities were physical, visual, and auditory. The most commonly used instrument to measure coping strategies was the Athletic Coping Skills Inventory-28 (ACSI-28), one study used the Mini-COPE Inventory for Measuring Coping with Stress (Turoń-Skrzypińska et al., 2020), and one study used the Coping Inventory for Stressful Situations (CISS) (Urbański et al., 2022). All studies that investigated burnout used the Athlete Burnout Questionnaire (ABQ).

Figure 2 shows the continent and country of publication, year of publication, and number of studies published per country. North America had two publications, Europe had four publications, Africa had one publication, and Asia

had one publication. The eight studies were done in seven different countries: Canada (Perreault & Vallerand, 2007), China (Li et al., 2018), the United States (Martin & Malone, 2013), Hungary (Szájer et al., 2019), England (Ho et al., 2015), Nigeria (Ofoegbu et al., 2020), and Poland (Turoń-Skrzypińska et al., 2020; Urbański et al., 2022). The year of publication ranged from 2007 to 2022.

Associations with burnout and coping

The main associations of psychological and physical variables found with burnout and coping are described in Table 1. Socially prescribed perfectionism was related to the burnout symptom reduced sense of sports performance from a cross-sectional study with moderate risk of bias, with socially prescribed perfectionism responsible for a 15% variation in this burnout symptom (Ho et al., 2015). In a randomized controlled trial study with low risk of bias, the digital history intervention reduced thoughts of burnout compared to their control group peers (Ofoegbu et al., 2020), and another longitudinal study with moderate risk of bias highlighted that burnout and sleep do not have a reciprocal relationship, but burnout can affect sleep and not vice versa (Li et al., 2018).

One of the main psychological and physical associations found with coping was self-determined motivation, with

Table 1 Description of studies included for final analysis

Study	Objectives	Type of study	Modality	Sample	Type of disability	Instrument	Main results
Perreault and Vallerand (2007)	To examine the sports motivation and coping skills of female and male wheelchair basketball players with and without disabilities	Cross-sectional	Wheelchair basketball	47 wheelchair basketball athletes (average age not given, and numbers of male and female disabled athletes not clear)	Not specified	Athletic Coping Skills Inventory-28 (ACSI-28)	Coping strategies dealing with adversity, performance under pressure, concentration, confidence/motivation, goals/mental preparation, and training ability are positively associated with more self-determined forms of motivation and negatively associated with motivation
Martin and Malone (2013)	Evaluate and describe coping strategies among wheelchair rugby players and predict engagement (vigor, dedication, enthusiasm, and confidence) in sport using coping strategies	Cross-sectional	Wheelchair rugby	14 athletes in wheelchair rugby (mean age 28.4 ± 6.0 years)	Spinal cord injury, bilateral amputation, and spina bifida	Athletic Coping Skills Inventory-28 (ACSI-28)	The coping strategies performance under pressure, confidence/motivation, concentration, and trainability showed moderate to strong correlations with the dimensions of vigor, enthusiastic engagement, and confident engagement, and the coping strategies were predictors of engagement
Ho et al. (2015)	To examine whether the hearing condition moderated the relationship between the dimensions of perfectionism and burnout symptoms in deaf and hearing athletes	Cross-sectional	Not specified	209 athletes with disabilities (mean age of 27.3 ± 9.3 years), both male and female (number of each not clear)	Mild (5%), moderate (6%), severe (11%), and profound hearing loss (78%)	Athlete Burnout Questionnaire (ABQ)	Social perfectionism was correlated with a reduced sense of sports performance. The condition of being a listener or non-listener did not moderate the indicators of burnout or perfectionism
Li et al. (2018)	To investigate the interaction between burnout and sleep quality in blind soccer players	Longitudinal	Five-a-side football	10 male players (mean age of 24.8 ± 2.53 years)	Visual impairment	Athlete Burnout Questionnaire (ABQ)	The results suggest that burnout and sleep are not reciprocally related, but burnout may be a risk factor for sleep problems among athletes

Table 1 (continued)

Study	Objectives	Type of study	Modality	Sample	Type of disability	Instrument	Main results
Szajer et al. (2019)	To investigate differences in psychological profiles (coping) between Paralympic and Olympic swimmers. To compare the results of males and females and of more successful swimmers (Paralympic medalists) with non-medalists' swimmers	Cross-sectional	Para-swimming	18 Paralympic swimmers (mean age of 26.3 ± 10.81 years), with 9 males and 9 females	Not specified	Athletic Coping Skills Inventory-28 (ACSI-28)	Paralympic medalists showed higher levels of worry-free strategies than non-medalists, demonstrating superior performance in winning Paralympic medals when compared to their peers
Turoń-Skrzypińska et al. (2020)	To evaluate the relationship between coping strategies and the level of education, disability category, and its duration in handcyclists before a competition	Cross-sectional	Handcycling	44 handcycling athletes (mean age of 41.8 ± 11.6 years), 37 males and 7 females	Five (12%) individuals with cervical spine injury, 15 (34%) with thoracic spine injury, and 24 (54%) with lower limb amputations or lumbar spine injuries	Mini-COPE Inventory for Measuring Coping with Stress	There was a relationship between classification and coping. Athletes with cervical injury had reduced coping indicators for actively dealing with stress and positive reassessment in relation to their peers with injury in the lumbar section. The athletes with injury in the thoracic section had a weaker sense-of-humor strategy than their peers with injury in the lumbar section
Ofoegbu et al. (2020)	To verify the effectiveness of digital history as an intervention for burnout thoughts among adolescent athletes with disabilities	Randomized controlled trial	Running, alking, sitting in a wheelchair, throwing, swimming, and power lifting	171 adolescent athletes with disabilities, 85 in the intervention group (mean age 20.1 ± 3.15 years), with 49 (44.1%) males and 36 (60%) females, and 86 in the control group (mean age 20.5 ± 3.07 years), with 62 (55.9%) males and 24 (40%) females	Impaired muscle power; impaired passive range of motion; difference in leg length; short stature; and visual impairment	Athlete Burnout Questionnaire (ABQ)	The digital history intervention reduced burnout thoughts among adolescent athletes with disabilities in the intervention group compared to athletes in the control group. In the follow-up evaluation, the decrease in burnout scores was maintained by the athletes in the digital history intervention group

Table 1 (continued)

Study	Objectives	Type of study	Modality	Sample	Type of disability	Instrument	Main results
Urbański et al. (2022)	To investigate the impact of the COVID-19 pandemic on mental health, coping styles, and their relationship in elite athletes with disabilities during a ten-month period	Longitudinal	Swimming, athletics, sitting volleyball, and fencing	75 athletes with disabilities participated in the study. The majority were male (70.1%), and their mean age was 33 ± 11.90 years	The main types of disability reported by athletes were amputation (34.7%), "Les Autres" (30.1%), spinal cord injury (26.7%), and cerebral palsy (8.0%), and the mean time since injury or diagnosis of disease was 18.8 ± 13.90 years	Coping Inventory for Stressful Situations (CISS)	The results show a relationship between emotion-oriented coping and anxiety and avoidance coping and depression during the period of the pandemic COVID-19. Emotion-oriented coping predicts anxiety, and depression predicts avoidance-coping

canonical correlation scores of 0.76 to 0.65 for function 1 and 2 respectively, in a cross-sectional study with high risk of bias (Perreault & Vallerand, 2007). Engagement was associated with coping strategies ranging in magnitude from moderate to strong ($r = 0.61$ to 0.85), with coping predicting 50% of engagement in a cross-sectional study with moderate risk of bias (Martin & Malone, 2013). Athletes with disabilities who won medals in the Paralympic Games presented higher levels of the freedom from worry coping strategy than their non-medalists' counterparts, as indicated by a cross-sectional study with a moderate risk of bias (Szájér et al., 2019). The results of a longitudinal study with moderate risk of bias conducted during the pandemic period COVID-19 showed that the emotion-oriented coping predicts anxiety, and depression predicts avoidance-coping (Urbański et al., 2022). Finally, a cross-sectional study with moderate risk of bias highlighted that athletes with lower functional impairments use more coping strategies than their counterparts with greater functional impairments (Turoń-Skrzypińska et al., 2020).

Quality of the studies

The evaluations of the risk of bias of the studies with cross-sectional designs are shown in Table 2. Four of the five studies with cross-sectional designs had a moderate risk of bias (Ho et al., 2015; Martin & Malone, 2013; Szájér et al., 2019; Turoń-Skrzypińska et al., 2020), and one study had a high risk of bias (Perreault & Vallerand, 2007). All studies were of low quality because they did not clearly define the inclusion criteria of the sample. Table 3 shows the risk of bias for longitudinal studies (Li et al., 2018; Urbański et al., 2022). The risk of bias was considered moderate because the studies failed to determine whether the sample was unbiased regarding the study outcome at the beginning of data collection and to mention the confounding factors. Finally, Table 4 presents the risk of bias of the randomized controlled trial (Ofogebu et al., 2020), which was low.

Discussion

The aims of this systematic review were a) to synthesize the literature on burnout and coping in athletes with disabilities and b) to identify the psychological and physical variables associated with burnout and coping in this population. Among the main results, we can highlight i) a predominance of studies with a cross-sectional design ($n = 5$), two with a longitudinal design, and one randomized controlled clinical trial; ii) the studies samples ranged from 10 to 209 athletes with disabilities, and most studies ($n = 5$) presented samples with smaller than 50 participants; iii) the risk of bias for cross-sectional studies ranged from moderate to high, while

the longitudinal studies showed moderate risk of bias and the randomized controlled trial showed a low risk of bias; iv) the year of publication of the studies ranged from 2007 to 2022, with eight publications from seven different countries, including Canada, China, United States, Hungary, England, Nigeria, and Poland; and v) the primary psychological associations found with coping were self-determined motivation, anxiety, and depression. In terms of physical factors, performance and classification were identified as relevant factors; and vi) regarding burnout, the psychological factors associated were socially prescribed perfectionism and sleep, while no physical factor was found to be associated.

Characteristics of the studies and assessment of the risk of bias

The predominance of cross-sectional studies limits the inference of any causal relationships (Ho et al., 2015; Perreault & Vallerand, 2007), and the relatively small samples make it impossible to extrapolate the results to the whole population (Martin & Malone, 2013). However, it is important to note that a small sample may not be a limitation but rather a natural part of investigating athletes with high-performance disabilities, a small population worldwide (Szájer et al., 2019).

The moderate (Ho et al., 2015; Martin & Malone, 2013; Szájer et al., 2019; Turoń-Skrzypińska et al., 2020) and high risk of bias (Perreault & Vallerand, 2007) of the cross-sectional studies decreased their methodological quality. In addition, the lack of standardization in describing the sample in detail (e.g., type of disability, classification, and gender) prevents us from identifying confounding factors that may interfere with the results (e.g., athletes with disabilities with greater functional impairment have more indicators of burnout than their peers with less functional impairment). The moderate risk of bias identified in one of the longitudinal studies (Li et al., 2018) presents a similar level of fragility as the cross-sectional studies. This is primarily due to the lack of clarity regarding whether the sample was unbiased with respect to the study outcome at the beginning of data collection. Another longitudinal study with moderate risk (Urbański et al., 2022) failed to identify possible confounding factors and to deal with them. The only study that presented a low risk of bias (Ofoegbu et al., 2020) had a randomized controlled clinical trial design, which is considered the gold standard in human research (Carvalho et al., 2013). Therefore, these points that hinder the methodological quality should be accounted for in future studies to reduce their risk of bias, improve their methodological quality, and standardize their descriptions of their samples, all important aspects for the performance of meta-analyses.

China, England, and the United States were the countries of origin of three of the studies cited in this review. These are Paralympic powers, being among the top 10 medal

winners in each of the last four Paralympic Games (Peking 2008, London 2012, Rio 2016, and Tokyo 2020). However, countries that are not considered Paralympic powers, such as Canada, Poland, Nigeria, and Hungary, though Poland was among the top 10 medal winners in the last two Paralympic Games, were also the site of study. In this sense, regardless of the performance of the country in the Paralympic Games, it is necessary to continue scientific research with new studies on the variables burnout and coping in athletes with disabilities because burnout can negatively impact the athletes (Madigan et al., 2022) and compromise their psychological well-being (Květon et al., 2021). While coping can help them adapt, mitigating burnout (Goodger et al., 2007; Madigan et al., 2020).

Association of psychological variables with burnout and coping

An association found was between burnout and socially prescribed perfectionism (Ho et al., 2015), defined as an individual's perception of unrealistically high standards about what others expect (Smith et al., 2018). Perfectionism is among the most investigated personality factors (Gustafsson et al., 2016), and burnout is influenced by personality factors (Goodger et al., 2007; Gustafsson et al., 2011). Thus, socially prescribed perfectionism is a predictor of burnout because highly unrealistic standards generate excessive concerns and hinder the establishment of efficient coping strategies to deal with the stress caused when the athlete tries to meet them (Madigan et al., 2016).

A unilateral association was found between burnout and sleep, which may impair sleep quality (Li et al., 2018). The high physical and psychological demands combined with inadequate recovery may promote the onset of burnout symptoms (Efficacy et al., 2018). Sleep is an important component of the physical and mental recovery of high-performance athletes (Granz et al., 2019). Thus, the unilateral association between burnout and sleep can exist because sleep quality is impaired by stress. Burnout, considered a reaction to chronic stress, directly affects sleep quality (Gerber et al., 2018). In addition, excessive training and competition can decrease recovery time and consequently impair sleep quality (Vlahoyiannis et al., 2021).

Regarding coping, the positive association between coping and self-determined motivation and the negative association between coping and self-motivation (Perreault & Vallerand, 2007) can be explained by the theory of self-determination. This theory is composed of different types of motivation, such as the most self-determined motivation (intrinsic motivation), when the subject engages in an activity of his own will, and the least self-determined motivation (extrinsic motivation), when the subject remains

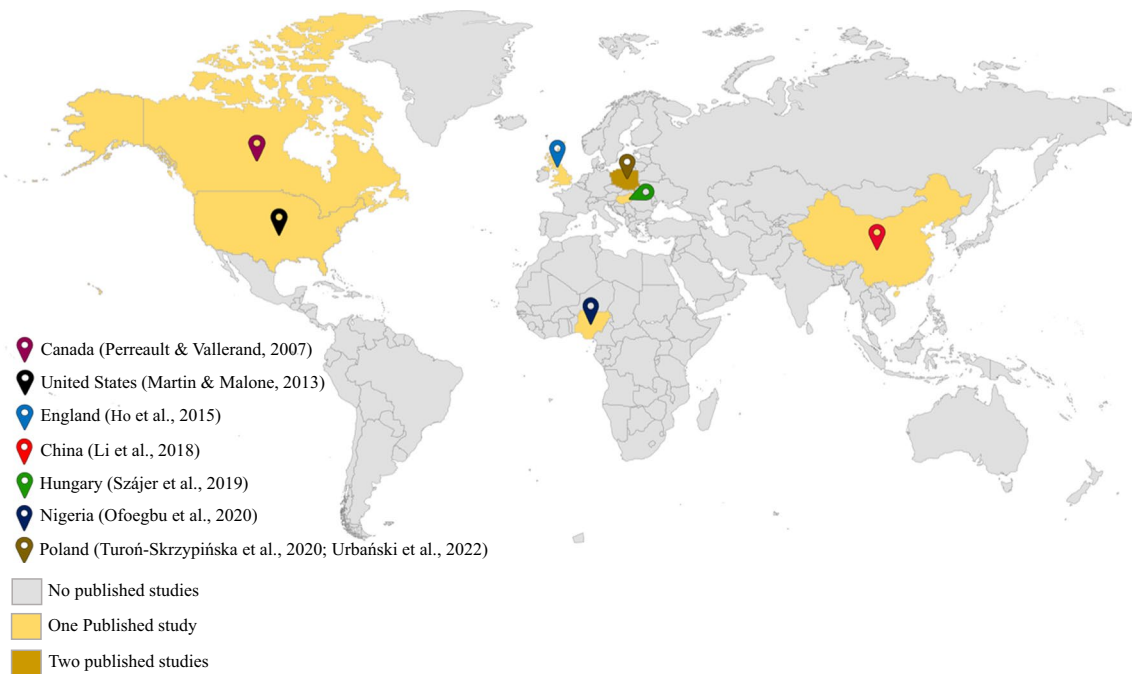


Fig. 2 Continent and country of publication, publication year, and number of published studies

Table 2 Assessment of risk of bias of the cross-sectional studies

Study	1	2	3	4	5	6	7	8	Total score	Risk of bias
Perreault and Vallerand (2007)	N	N	S	NC	N	N	S	NC	2	High
Martin and Malone (2013)	N	S	S	S	S	NC	S	S	6	Moderate
Ho et al. (2015)	N	S	S	S	NC	S	S	S	6	Moderate
Szájér et al. (2019)	N	S	S	S	NC	N	S	S	5	Moderate
Turoń-Skrzypińska et al. (2020)	N	S	S	S	NC	S	S	S	6	Moderate

Legend: 1 = Were the criteria for inclusion in the sample clearly defined? 2 = Were the study subjects and the setting described in detail? 3 = Was the exposure measured in a valid and reliable way? 4 = Were objective, standard criteria used for measurement of the condition? 5 = Were confounding factors identified? 6 = Were strategies to deal with confounding factors stated?; 7 = Were the outcomes measured in a valid and reliable way? 8 = Was appropriate statistical analysis used?; N No; Y Yes; NC Not clear; NA Not applicable

Table 3 Assessment of the risk of bias for the longitudinal study

Study	1	2	3	4	5	6	7	8	9	10	11	Total score	Risk of bias
Li et al. (2018)	NA	NA	S	S	S	NC	S	S	S	NA	S	7	Moderate
Urbański et al. (2022)	NA	NA	S	NC	NC	S	S	S	S	NA	S	6	Moderate

Legend: 1 = Were the two groups similar and recruited from the same population? 2 = Were the exposures measured similarly to assign people to both exposed and unexposed groups? 3 = Was the exposure measured in a valid and reliable way? 4 = Were confounding factors identified?; 5 = Were strategies to deal with confounding factors stated?; 6 = Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? 7 = Were the outcomes measured in a valid and reliable way? 8 = Was the follow up time reported and sufficient to be long enough for outcomes to occur? 9 = Was follow up complete, and if not, were the reasons for loss to follow up described and explored? 10 = Were strategies to address incomplete follow up utilized? 11 = Was appropriate statistical analysis used?; N No; Y Yes; NC Not clear; NA Not applicable

Table 4 Assessment of risk of bias for the randomized controlled trial

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	Total score	Risk of bias
Ofoegbu et al. (2020)	S	S	S	S	NC	S	S	S	S	S	S	S	S	12	Low

Legend: 1 = Was true randomization used for the assignment of participants to treatment groups? 2 = Was allocation to treatment groups concealed? 3 = Were treatment groups similar at the baseline? 4 = Were participants blinded to treatment assignment? 5 = Were those delivering treatment blind to treatment assignment? 6 = Were outcome assessors blinded to treatment assignment? 7 = Were treatment groups treated identically other than the intervention of interest? 8 = Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed? 9 = Were participants analyzed in the groups to which they were randomized? 10 = Were outcomes measured in the same way for treatment groups? 11 = Were outcomes measured in a reliable way? 12 = Was appropriate statistical analysis used? 13 = Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial? *N* No; *Y* Yes; *NC* Not clear; *NA* Not applicable

in an activity driven by external reasons (Deci & Ryan, 2008a). In contrast, amotivation is defined by the absence of the intention to act of one's own free will (Deci & Ryan, 2008b). Thus, athletes with self-determined motivation are willing to establish good standards for their performance, making the sport interesting and important. The athlete copes better and is inclined to respond in an adaptive manner to the stressful situation to achieve good sports performance, unlike the athlete who is extrinsically motivated (Mouratidis & Michou, 2011).

Another association was found between coping and engagement (Martin & Malone, 2013), where coping predicts engagement. Engagement is a positive state of mind related to sport that leads to a lasting and stable sport experience (Kuokkanen et al., 2021). Engagement can be considered the opposite of burnout (De Francisco et al., 2020), which explains because coping has a relationship with engagement, since coping has a protective action against burnout (da Silva et al., 2021) as well as engagement (Scotto di Luzio et al., 2019). Furthermore, the association between coping and engagement can be explained by the fact that engaged athletes exert more vigor to cope with stress efficiently (Nicholls et al., 2016a), which is characteristic of the problem-focused coping strategy (Nicholls & Polman, 2007).

The positive associations found between coping, anxiety and depression in athletes with disabilities, in which emotion-oriented coping predicted increased anxiety and depression predicted increased avoidant-oriented coping, seem intuitive (Urbański et al., 2022). Because maladaptive coping strategies such as emotion-oriented and avoidance are associated with negative aspects of health and performance (Nicholls et al., 2016b) and avoidance is characteristic of people with depression (Nixdorf et al., 2013). While avoidance and emotion-focused coping strategies can be helpful in certain occasions (e.g., when the athlete cannot resolve or control the problem) (Nicholls & Polman, 2007). These strategies are generally less effective, because avoiding negative stress responses is physically and emotionally exhausting for a prolonged period and can lead to devaluation, characteristic of burnout symptoms (Madigan et al.,

2020; Nicholls & Polman, 2007). Finally, these associations involve variables that can potentially impact the mental health and the physical performance of athletes with disabilities, such as depression. Depression can be associated with both stress and burnout (De Francisco et al., 2016). However, no study has been conducted to investigate the relationship between depression, anxiety, and coping with burnout specifically in athletes with disabilities.

Although the studies included in this review have investigated important psychological variables that contribute to the field of Paralympic sport psychology, athletes with disabilities, and professionals involved with Paralympic sport or adapted sport. No studies have analyzed a possible association between burnout and coping in athletes with disabilities, although we can affirm that the achievements in high-performance sports require long-term exposure to challenges, arduous training days, and stressful situations, which may cause burnout (Lin et al., 2021). Coping is any mechanism for managing stress (Poulus et al., 2021) and predicting the symptoms of burnout (da Silva et al., 2021). Therefore, finding correlates or predictors of these variables could help maintain the psychological well-being and performance of athletes with disabilities.

Association of physical variables with burnout and coping

Only one study showed an association between classification and coping. Athletes with a higher classification, i.e., lower functional impairment, used more coping strategies than their peers with greater functional impairment. The most used strategies included active coping with stress, positive reappraisal, and a sense of humor (Turoń-Skrzypińska et al., 2020). In that regard, athletes with less functional impairment may have a more robust repertoire for coping strategies, because they use both problem-focused (e.g., active coping with stress) and emotion-focused (e.g., positive reappraisal and sense of humor) strategies. Furthermore, athletes with disabilities who have less functional impairment have better performance in specific measures of the sport (e.g.,

the wheelchair basketball pass) (Tachibana et al., 2019). Thus, athletes with disabilities with less functional impairment may use more coping strategies because these are positively associated with performance (Poulus et al., 2020).

No studies investigated an association between the classification and burnout symptoms, although the Paralympic sports classification process is considered stressful when the athletes compete in a higher classification than they ought to, making the competition unfair because they will compete with athletes with less functional impairment, for example, because of a reclassification or incorrect classification (Martin, 2017). In addition, the athlete can be considered ineligible and can no longer compete due to a controversial classification process, even after building a successful career with medal achievements in the Paralympic and World Games (Barbosa et al., 2021). Therefore, athletes with disabilities may develop burnout if this stress source becomes chronic and their sport performance is impaired.

Only one study identified an association between coping and performance. Athletes with disabilities who used the worry-free coping strategy more often performed better in terms of winning Paralympic medals than their peers who were not medalists. (Szájér et al., 2019). Even though performance is important in Paralympic sports (Perret, 2015) and burnout syndrome negatively affects performance (Bicalho & Costa, 2018; Goodger et al., 2007), no study has investigated burnout and performance measures in athletes with disabilities. Thus, it is necessary to understand which measures of sports performance burnout can interfere (Eklund & Defreese, 2015).

Limitations

The present review has some limitations, such as the few studies included, the lack of standardized descriptions of the methods used, and the different types of studies, which prevented us from performing a review with meta-analysis. In addition, the exclusion of mixed and qualitative methods studies may have contributed to the lower number of studies. However, this may not be a limitation of the present review but rather of the scientific research on the subject, as the field of burnout and coping in athletes with disabilities is still in an incipient stage. Finally, it is imperative to exercise caution when considering the synthesis of evidence due to the low methodological quality and a moderate risk of bias observed in six out of eight studies, coupled with one study exhibiting a high risk of bias. An additional caution pertains to the specificity of the study samples included in this review.

Future research directions

This study presents some directions for future studies, such as a) the use of study designs that can infer causal relationships, such

as longitudinal studies; b) investigations about the association between classification and burnout and coping indicators in athletes with disabilities; c) investigations about how burnout and coping can interfere with subjective performance measures (e.g., the athlete's self-assessment or placement in the championship) or objective performance (e.g., number of right and wrong passes, assists, scored points); d) depending on the sample size, the use of more robust statistical analytical methods, such as latent profile analysis (person-centered) is wanted, so it will be possible to identify cutoff points for burnout and identify whether athletes with greater functional impairment are more or less prone to symptoms of burnout and use more or fewer coping strategies than athletes with less functional impairment (according to the classification); e) to analyze whether perceptions of burnout symptoms and coping strategies differ in athletes with acquired and congenital disabilities; and f) to identify the prevalence of burnout in athletes with disabilities.

We believe that based on this review and suggestions for future studies, it will be possible to stimulate further research on the psychology of Paralympic sport and provide insights into variables that have been little studied in athletes with disabilities and that directly affect health, performance, and athletic success. In this way, sport psychologists and professionals working with Paralympic sport or adapted sport will have more high-quality evidence to develop training programs, interventions, and practical applications with studies in the field of Paralympic sport psychology.

Conclusion

This is the first systematic review of burnout and coping in athletes with disabilities that provides an overview of the studies conducted. It contributes to scientific advances in Paralympic sport psychology to provide insight to athletes with disabilities and professionals working in Paralympic sport. Scientific research on burnout and coping in athletes with disabilities is in the exploration phase, given the few studies found in the literature. In sum, burnout is associated with socially prescribed perfectionism and sleep, while coping strategies are associated with self-determined motivation, engagement, anxiety, depression, performance and classification.

Authors contribution Rodrigo Weyll Ferreira: Conceptualization, Data Curation, Methodology, Investigation, Writing- Original draft preparation, Project administration; Anselmo de Athayde Costa e Silva: Writing- Reviewing and Editing, Conceptualization; Maria Regina Ferreira Brandão: Writing- Reviewing and Editing, Conceptualization; Marília Passos Magno e Silva: Writing- Reviewing and Editing, Conceptualization; Jhonatan Wellington Pereira Gaia: Data Curation, Methodology, Investigation; Daniel Alvarez Pires: Conceptualization, Supervision, Project administration, Data Curation, Writing- Reviewing and Editing, Funding acquisition.

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Data availability Data supporting this study is openly available in the Mendeley Data repository at: <https://doi.org/10.17632/j4v965whs4.1>.

Declarations

Ethical approval This article does not contain any studies with human participants or animal performed by any of the authors.

Informed consent This article does not contain any studies with human participants or animal performed by any of the authors.

Conflict of interest The authors have no conflicts of interest to declare.

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