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Stressors and coping strategies in esports: a systematic review

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ABSTRACT

In this systematic review, we provide an overview of stressors and coping strategies in esports, emphasizing the goal of informing applied practice and guiding future research. Guided by the PRISMA guidelines and employing the SPIDER framework, we synthesize findings from 19 studies. Performance stressors such as defeat and performance pressure (e.g. pressure to win) were prominently observed, along with team, social, organizational, and personal stressors. Coping strategies, aligned with Nicholls et al. ((2016). The development of a new sport-specific classification of coping and a meta-analysis of the relationship between different coping strategies and moderators on sporting outcomes. *Frontiers in Psychology*, *7*(11), 1–14), demonstrate internal regulation was the most frequently reported, followed by mastery coping, while goal withdrawal strategies were less frequently reported. Comparing esports to traditional sports highlights the role of social stressors such as social media and public perceptionin esports. However, personal stressors remain relatively unexplored. The review also identifies research gaps in stressor appraisal and communal coping strategies. Future research could delve into personal stressors, considering a wide array of psychological factors, and employing dynamic methodologies. Practical implications revolve around tailored interventions, promoting open communication, mastery coping techniques, and holistic well-being strategies. This review provides a broader understanding of esports stressors and coping strategies, offering a starting point for targeted interventions aimed at enhancing performance and well-being in the distinctive competitive landscape of esports.

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In recent years, the world of esports has gained immense popularity, attracting a diverse global audience and becoming an area of interest for sport and exercise psychology research (e.g. Leis et al., 2021). Esports, defined as individual- or team-based activities involving specific competitive video games with ranking systems at amateur and professional levels (Pedraza-Ramirez et al., 2020), share similarities with traditional sports in terms of performance demands. Success in esports is associated with high levels of confidence, sustained focus, and immersion in flow states (Nagorsky & Wiemeyer, 2020; Poulus et al., 2022a). To maintain cognitive (e.g. strategical thinking) and motor performance (e.g. eye-hand coordination) as well as well-being, esports demand effective coping with stressors within the competitive environment (Leis et al., 2021, 2022). Guided primarily by Lazarus' transactional perspective (Lazarus, 1999; Lazarus & Folkman, 1984), research has provided insights into key stressors and coping strategies in esports (Leis et al., 2022; Poulus et al., 2022b, 2022c; Smith et al., 2019). While an expanding body of literature explores stressors and coping in esports, diverse methodologies (e.g. participant samples, data collection methods, and stressor/coping descriptions) pose challenges for meaningful comparisons and conclusions across studies (e.g. Nicholls et al., 2016; Nicholls & Polman, 2007). Acknowledging this heterogeneity, we provide an overview of stressors and coping strategies in esports. By synthesizing existing findings, our aim is to gather insights and enhance our understanding of the multifaceted nature of stressors and coping in esports. This synthesis offers an overview that not only captures the diversity of stressors and coping strategies, but also serves as a resource to guide and inform future research and inform applied practices.

Theoretical framework

Stress can be defined as the result of a transaction between the individual and the environment (Lazarus, 1999, 2000). According to this transactional perspective, stress is dependent on the appraisal of stimuli (Lazarus, 1966), which involves primary and secondary appraisal (Lazarus & Folkman, 1984). Primary appraisal describes the evaluation of a stimulus as relevant to one's beliefs, values, goal commitments, and situational intentions (Lazarus, 1999), while secondary appraisal involves the evaluation of one's control, resources, and likelihood to manage the stimulus (Lazarus, 1999; Lazarus & Folkman, 1984). If an individual perceives external and/or internal demands as taxing or exceeding one's resources (i.e. stressors), they may employ coping strategies. Coping involves ongoing cognitive and behavioral efforts to manage specific stressors (Lazarus & Folkman, 1984).

Building on this transactional perspective, Fletcher and Fletcher (2005) developed the meta-model of stress, emotion, and performance. This meta-model includes three stages: person-environment fit, emotion-performance fit, and coping and overall outcome (see Fletcher et al., 2006). In the first stage, the primary and secondary appraisal of the person-environment transaction takes place (e.g. Lazarus, 2000), followed by a second cognitive process of relational meaning, including tertiary and quaternary appraisal, in the second stage. *Tertiary appraisal* describes the evaluation of one's positive and negative response to primary and secondary appraisal as relevant to an individual's performance, while *quaternary appraisal* assesses available coping strategies. In the last stage of the meta-model (i.e. coping and overall outcome) coping strategies are employed, leading

to positive and negative outcomes that affect the perception of future stressors (e.g. Fletcher & Fletcher, 2005). Overall, the meta-model provides an appropriate framework to investigate stressors and coping relating to stress in competitive environments (e.g. Fletcher et al., 2006).

Empirical evidence

Research providing support for the meta-model of stress, emotion, and performance in the sports context highlights a variety of stressors resulting from the person-environment transaction (e.g. Fletcher et al., 2006). In sports, stressors are frequently categorized into competitive, organizational, and personal stressors (Fletcher et al., 2006; Neil et al., 2011; Sarkar & Fletcher, 2014). Whereas competitive stressors are directly related to aspects of sports performance (e.g. rivalry, poor preparation, match outcome), organizational stressors are primarily and/or directly associated with the sports organization (e.g. travel, schedules, coaching style; Didymus et al., 2021). Personal stressors refer to an individual's personal life outside of sport (e.g. finances, family issues, work-life balance; Didymus & Jones, 2021).

Coping strategies in sports are classified in different ways (see review by Crocker et al., 2015; Nicholls & Polman, 2007), but were traditionally categorized as either *problem-* or *emotion-focused* (Lazarus & Folkman, 1984). Problem-focused coping strategies describe attempts to manage the respective stressor (e.g. planning and goal setting), whereas emotion-focused strategies describe attempts to regulate the emotions tied to the stress situation (e.g. breathing and visualization; Lazarus, 1999). Additional categories of coping have since been proposed (e.g. Nicholls & Polman, 2007; Skinner et al., 2003). Nicholls et al. (2016) proposed a classification of coping, including *mastery coping*, *internal regulation*, and *goal withdrawal*, so that comparisons could be made across different studies that used different classifications of coping. Mastery coping can be defined as attempts to take control of a stressful situation and thus eliminate the stressor (e.g. problem-focused, task-oriented, approach coping). Internal regulation refers to attempts to manage internal resources to stress (e.g. emotion-focused, avoidance-focused; Nicholls et al., 2016). Goal withdrawal defines individuals ceasing in their efforts to achieve a goal (e.g. disengagement-oriented coping, mental disengagement; Nicholls et al., 2016).

Lazarus (1999) argued that coping strategies are intertwined, affect each other, and are part of a complex process that aims to influence the transaction between a person and the environment. In addition, research shows that personal (e.g. age, gender) and situational characteristics (e.g. type of stressor) influence the use and effectiveness of coping strategies (e.g. Anshel & Wells, 2000; Nicholls & Polman, 2007). Furthermore, studies indicated that athletes' cognitive appraisal (e.g. primary and secondary appraisal) is related to both, the use of coping strategies and performance outcomes (see review by Nicholls & Polman, 2007). In 2013, Crum et al. introduced the concept of the stress mindset, which refers to an individual's believes in whether stress contributes to enhancing or debilitating associated outcomes (e.g. performance, health, well-being, and growth). Research has provided substantial evidence regarding the role of 'stress-is-enhancing' and 'stress-is-debilitating' mindsets across domains such as performance (Akinola et al., 2016; Crum et al., 2017), well-being (Crum et al., 2013), and psychophysiological responses (e.g. Crum et al., 2017; Journault et al., 2023). Regarding coping, a meta-

analysis by Nicholls et al. (2016) demonstrated a relationship between mastery coping and positive affect, whereas internal regulation was associated with negative affect. Conversely, mastery coping was positively associated with sports performance, while goal withdrawal was negatively associated with performance. However, no significant association was found between performance and internal regulation (Nicholls et al., 2016). In summary, research among athletes has highlighted the relationship between stress appraisals, emotions, and coping and performance satisfaction (Britton et al., 2019; Martinent & Ferrand, 2015; Neil et al., 2011; Nicholls et al., 2012).

Study purpose

Leis and Lautenbach (2020) provided an overview of empirical evidence on stress responses in esports, highlighting varied results related to competitive gameplay. Among the five studies reviewed in competitive gameplay, three showed no hormonal reaction (Chaput et al., 2011; Gray et al., 2018; Oxford et al., 2010), one demonstrated increased anxiety and cortisol levels in winners postgame (Schmidt et al., 2020), and two studies identified sympathetic nervous system activation (Behnke et al., 2020; Chaput et al., 2011). Following the authors' call for more research on psychological and physiological stress in esports, studies have demonstrated endocrine and cardiovascular responses during competitive gameplay (e.g. Kraemer et al., 2022; Mendoza et al., 2021). Although research on esports players' experiences (e.g. stressors) and behaviors (e.g. coping) has proliferated over recent years (e.g. Leis et al., 2022; Poulus et al., 2022b; Smith et al., 2019), there is a lack of an overview of stressors and coping in esports similar to Leis and Lautenbach's (2020) review of stress responses. In addition, existing esports research uses various categories to report stressors and coping strategies. For instance, Leis et al. (2022) categorized stressors into performance expectations, internal evaluation, team issues, audience and social media, and environmental constraints. In contrast, Poulus et al. (2022b) outlined performance, teammate, external individuals, balancing life commitments, and technical issues as stressor categories. This diversity underscores the absence of standardized approaches in the field, impacting the comparability and generalizability of findings. The substantial increase in the number of studies on stressors and coping strategies, along with heterogeneity among participant samples, descriptions of stressors and coping, and classifications used, contributes to ambiguity when comparing studies (e.g. Nicholls et al., 2016; Nicholls & Polman, 2007). Practitioners in esports (e.g. coaches and sport psychologists) would find it difficult to compare existing studies to identify the most prevalent stressors and coping strategies. Additionally, practitioners new to esports may encounter challenges in transferring knowledge from more established areas, such as traditional sports, due to the nuances of the demands associated with esports and traditional sports. Therefore, summarizing this information in one paper and providing stressor and coping categories across esports research could benefit research by generating new ideas and the applied practices of practitioners such as coaches and psychologists working in esports. (e.g. Leis et al., 2021). For example, this resource could enable coaches to efficiently assess prevalent stressors and coping strategies within their teams, optimizing their engagement with esport players within the constraints of their time (e.g. Norris et al., 2017). To inform future research and applied work on a broader basis, this review also focused on associations

between stressors and coping strategies with other constructs that likely influence esports players' experiences (e.g. appraisals, gender dynamics). Additionally, providing a summary of existing research is also needed to identify gaps in the literature and to provide ideas for future research. Accordingly, the main aim of this review was to synthesize findings on stressors esports players' experience and coping strategies these players use to manage the demands in the competitive esports environment. Through this synthesis, we aimed to identify recurring themes and patterns in stressors and coping in esports. The secondary aim was to synthesize existing research on the relationship between stressors and coping with related constructs, including appraisals (e.g. threat vs challenge), gender dynamics, emotional responses, and heatlh outcomes. Therefore, this review will highlight directions for future research and facilitates the identification of common stressors and coping strategies in esports, and their associations with related constructs, offering a practical resource for coaches and sport psychologists.

Method

Protocol and eligibility criteria

The literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA; Page et al., 2021). In addition, we also considered guidelines for systematic reviews in the field of sport and exercise psychology (Gunnell et al., 2020; Gunnell et al., 2022), such as publishing study materials and using the SPIDER framework (Cooke et al., 2012). The SPIDER framework was used to ensure the identification of studies relevant to the aim of this review, as shown in Table 1 (Cooke et al., 2012). While stressors referred to 'environmental demands (i.e. stimuli) encountered by an individual' (Lazarus, 1999, p. 329), coping referred to 'constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person' (Lazarus & Folkman, 1984, p. 141). Due to the ongoing debate regarding which games represent esports (e.g. Pedraza-Ramirez et al., 2020), the literature search was restricted to certain competitive video games. These games are presented in the online supplementary material (https://osf.io/sd8vm/?view_only=7e2f862be5be485699af0535a60940da). To narrow our focus on valid results, unpublished studies were excluded to reduce the risk of bias. Similarly, exclusion criteria were applied for psychological (e.g. drug addiction) and physiological conditions (e.g. heart disease) as participant health can significantly affect stress appraisal and coping strategies. The study and protocol were pre-registered through the Open Science Framework on May 8, 2023: https://osf.io/xauv8?view_only=

Table 1. SPIDER Criteria for the Systematic Review.

Sample	Esport players at any age and level of competition (e.g. amateur, professional) and other esport roles (e.g. coaches, performance coaches) addressing the Phenomenon of Interest in esports players
Phenomenon of Interest	Stressors and coping strategies in esports
Design	Questionnaire, survey, observation, interview, case study, Delphi study, phenomenological/ethnographic study
Evaluation	View, experience, opinion, perception, appraisal, feeling, thoughts
Research type	Peer-reviewed studies

1505fa57d59b4e6abc06407b0d5afdcd. Experimental studies were excluded from this review, as they had been addressed in a previous review (Leis & Lautenbach, 2020). This review's focus centered on studies aligning with the SPIDER criteria, with the primary objective of identifying studies on the subjective experience of players on stressors and coping. Although the pre-registration initially reported a qualitative systematic review, the study design was updated and the criterion' research type' was changed to allow identifying studies of quantitative nature.

Information sources and search strategy

Search parameters were established using prevalent terms associated with esports, as reported in previous studies (e.g. Leis & Lautenbach, 2020). These terms were developed through an initial search of the literature across different databases, which identified pertinent search terms and appropriate databases for the review. The search included Web of Science and EbscoHost (i.e. PsychArticles, PsychInfo, SportDiscuss) without restricting the publication date. After piloting the search strategy, the original search was conducted on March 8, 2023. Given the rapid advancements in esports research, the search was carried out on January 3, 2024, to include new papers in the revised manuscript. The search terms remained consistent with the original search and included the following keywords: (*Stressor* OR stress OR appraisal* OR coping OR cope OR 'emotional regulation' OR Pressure**) AND (*esport OR esports OR 'electronic sport*' OR 'electronic gam*' OR 'competitive gam*' OR 'online gam*' OR 'video gam*' OR 'computer gam*'*). The following term was used to exclude studies that examine gambling, which is outside the scope of this study: *gambl**. Due to the search specificity limitations of certain databases, an additional search using a different search string was performed on Google Scholar, Sponet, and Science Direct (see supplementary material). The search also comprised reference list searching, citation searching, and hand searching. In addition, the tool ResearchRabbit (i.e. a mapping tool that can be used to create networks of papers) was used to identify additional relevant articles. Although studies not published in peer-reviewed journals were excluded, grey literature was checked and considered to establish a state of the art (e.g. Gunnell et al., 2020). As a result, relevant papers were considered to discuss the findings of this review. Furthermore, eight experts associated with stress and coping in esports were contacted in August 2023 to illuminate blind spots.

Data analysis

Selection process

At first, all results (i.e. titles and abstracts) were uploaded to the reference manager software Mendeley (Version 1.19.8) to check for duplicates. To minimize bias and reduce errors, two reviewers (authors 1 and 3) independently screened all titles and abstracts, and then retrieved full-texts for papers that met inclusion criteria for full eligibility screening. Consistency in this approach was maintained by repeating the same process during the updated search. Uncertainty regarding the inclusion of full-text articles was resolved through discussion, with no major disagreement. Overall, interrater reliability was $\kappa = 0.99$, representing almost perfect agreement (Landis & Koch, 1977). This high level of agreement between the two researchers could be attributed to factors including the

clarification of inclusion criteria, alignment in their interpretations of these criteria, and the large number of records screened.

Data collection process

The analysis of selected full-text articles consisted of two main components. Firstly, a descriptive analysis of general information (year, author, journal) and characteristics of participants (e.g. age, gender, and experience). Secondly, an in-depth analysis was performed to investigate the identified studies' findings regarding stressors and coping strategies. To ensure the accuracy of data extraction into an Excel spreadsheet, the initial extraction performed by the first author underwent a comprehensive review by author 3. This was only conducted following the initial search on March 3, 2023, as the subsequent search did not identify any additional articles. For data validation, all authors of the identified studies were contacted between July and August 2023. As a result of this process, there was one instance in which the extracted data underwent revision based on feedback from the corresponding author. However, we encountered difficulties in reaching one author due to the unavailability of contact information, while another corresponding author remained unresponsive after two formal requests, yielding a response rate of 92%.

Synthesis methods

The in-depth analysis was conducted collaboratively by the first and last author and started with familiarization and initial assessment of the included studies. Relevant sections from each study, addressing stressors and coping strategies, were extracted and organized in an Excel spreadsheet. Subsequently, the two researchers immersed themselves in the data, reflecting on the most appropriate way to categorize the information regarding stressors and coping. To ensure consistency and build upon existing frameworks, the researchers adopted the stressor classification framework proposed by Didymus et al. (2021), which includes competitive, organizational, and personal stressor categories. For coping strategies, the framework by Nicholls et al. (2016) was utilized, including mastery coping, internal regulation, and goal withdrawal strategies. To ensure accurate and reliable coding, a codebook was used for the analytic process (see supplementary material). After independently coding the data, the coding of both reviewers was compared to determine inter-rater reliability. Inter-rater reliability was $k = 0.75$ for stressors and $k = 0.72$ for coping, indicating substantial agreement between the researchers. Challenges influencing the agreement included incomplete reporting of stressors and coping contexts and limited access to raw data from identified studies. The subsequent discussion with the fifth author helped resolve disagreements in coding the coping strategies. In addition, this discussion prompted the two researchers to explore alternative ways of coding the stressors due to potential overlaps between competitive and organizational stressors. Following three additional discussions between the first and last author, stressors were re-coded into demands associated directly or indirectly with esports performance in competition and training (i.e. performance stressors), members of the team during and outside of competition (i.e. team stressors), interactions and relationships outside the team environment (i.e. social stressors), the esports organization (i.e. organizational stressors), and personal life outside of esports (i.e. personal stressors). Both researchers performed this process simultaneously

to ensure consistency and suitability. The verification process revealed no significant disagreements regarding the new coding scheme (for the coding spreadsheet, see supplementary material). Finally, both stressors and coping strategies were summarized in a table with representative codes, that provide a comprehensive understanding of the data. This process was performed by the first author and verified by the last author.

Quality assessment

To assess the quality of the identified studies, an own checklist adapted from the Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004) was used. Two researchers independently assessed the quality of each included study using a three-point-scale ('1′ = yes, '0′ = unclear, and '−1′ = no) across nine criteria. These criteria encompassed methodological appropriateness ('Was the methodological approach used in the study appropriate for addressing the research question and problem?), theoretical framework ('Is there a clear connection between the research question, methodological approach, and a reported theoretical framework?'), participant characteristics ('Are there sufficient and relevant baseline characteristics or demographic data describing the participants (e.g. *N*, age, gender) provided?'), eligibility criteria ('Are the eligibility criteria clearly specified?'), measurements ('Are the measurement instruments well-described and suitable for replication?'), data analysis ('Is the data analysis adequately described and appropriate?'), reporting the results ('Are the results adequately detailed?'), control of confounding and verification procedures ('Was confounding controlled for or addressed using verification procedures?'), and acknowledgement of limitations ('Are study limitations acknowledged?'). In cases where discrepancies arose between the two assessors, a consensus approach was employed to resolve disagreements. This involved the two researchers (authors 1 and 4) discussing their differing assessments and working together to find a resolution that both agreed upon. Following the independent quality assessment, the interrater agreement was $\kappa = 0.75$, representing substantial agreement (Landis & Koch, 1977). Factors contributing to this agreement may include variances in the interpretation of criteria among researchers and subjectivity in assessing aspects such as data analysis, control of confounding variables and verification procedures.

Results

Study selection

As shown in Figure 1, the search via databases resulted in 4.120 articles. Following the removal of 42 duplicates and 882 records marked as ineligible by automation tools, titles, and abstracts of 3.196 articles were screened. A total of 3097 records were excluded due to not meeting eligibility criteria (i.e. peer-reviewed studies focusing on stressors and/or coping in esports), resulting in 99 full-texts for further screening. Of these, 88 were excluded because: they did not focus on stressors and/or coping ($k = 44$), they did not include esports ($k = 30$), their study design was inappropriate for the research question ($k = 11$; e.g. intervention study), or did not appear in peer-reviewed publications ($k = 7$). Multiple reasons could be applied to the same article. The search of studies, conducted through contacting experts, citation searching, reference list searching, and Research Rabbit, resulted in 3.040 records. This search led to the identification of additional eligible

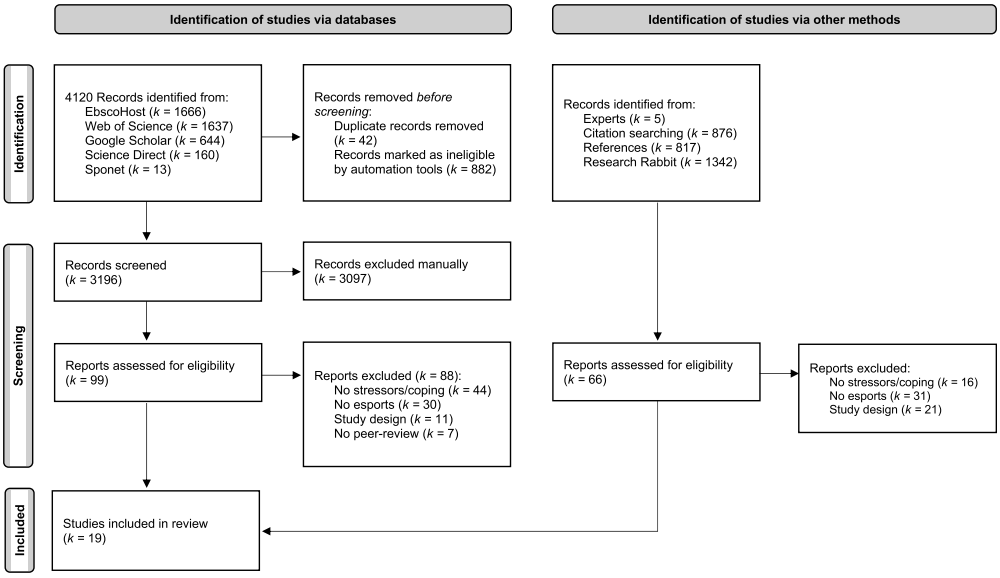

Figure 1. PRISMA 2020 Flow Diagram.

records by checking reference lists of included articles ($k = 3$) and citation searching ($k = 2$). Overall, 14 studies were identified via databases, while five studies were identified via other methods. As a result, 19 articles were included in the review.

Study characteristics

Within the 19 identified studies, 15 articles focused on players' experiences of stressors and/or coping strategies, whereas seven articles addressed the association between stress, coping, and other constructs such as gender, personality or mental toughness. Several studies covered both aspects (e.g. Poulus et al., 2020; 2022b). In alignment with the systematic literature review's objective, the results will be presented in two sections: one for stressors and coping strategies and another for their relationships with other constructs. Consequently, this review will detail the study characteristics of stressors and coping first, followed by associations with other constructs separately.

Methodologies

The following research methods were included in the 15 studies that examined stressors and coping (see Table 2), which included five survey studies (Behnke et al., 2021; Leis et al., 2023; Pereira et al., 2021; Poulus et al., 2020, 2022c), one observational study (Hussain et al., 2021), and ten interview studies. The interview-based studies comprised eight semi-structured interviews (Cote, 2017; Himmelstein et al., 2017; Hussain et al., 2021; Leis et al., 2022; Poulus et al., 2022a; Sabtan et al., 2022; Schubert et al., 2022; Smith et al., 2019) and one focus-group interview (Polat et al., 2023).

In the seven studies focusing on the relationship between stressors, coping, and other constructs (see Table 2, highlighted with asterisk), methodologies included six survey

Table 2. Descriptive Study Summary.

Study	Aim(s)	Theoretical framework	Participant information	Instrumentation	Key findings
Behnke et al. (2021), POL *	To identify which gaming situations elicit positive and negative emotions.	Motivational Dimensional Model of Affect (Gable & Harmon-Jones, 2010)	652 CS:GO players, 617 male gamers M_{age} = 20.75 (3.58) years $M_{experience}$ = 5.20 (4.19) years $M_{gameplay/week}$ = *19.57 (19.81)* hrs	Survey study with participants asked to describe a situation they felt intensely excited or zealous, amused or entertained, sad or miserable, enraged or angry during gameplay.	Anger was frequently related to negative own team (43%), negative performance outcomes (28%), negative rival-team (20%), communication (16%), underperforming (14%), and technical issues (13%). Sadness related to negative performance outcomes (45%), underperforming (25%), negative own team (17%), negative rival-team (9%), and communication (7%).
Cote (2017), USA	To explore women's strategies for coping with online game-related harassment.	NR	37 self-identified female gamers M_{age} = NR (range 19–45) $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Semi-structured interviews covering questions about positive and negative online experiences.	Coping strategies included leaving online gaming, avoiding strangers, camouflaging gender, deploying skill and experience, personality strategies, technical solutions (e.g. blocking harassers), relying on male assistance, and calculated use of flirtation ('unpopular alternatives).
Himmelstein et al. (2017), USA	To identify specific mental obstacles players face and any mental techniques gamers utilize.	Flow (Csikszentmihalyi, 1990)	5 male competitive LoL players M_{age} = 20.80 (1.64) years $M_{experience}$ = 3.20 (1.64) years competing $M_{gameplay/week}$ = *NR*	Semi-structured interviews covering future goals, mental strengths, challenges and obstacles, participation on teams, and mental preparation.	Obstacles included ineffective attentional control, negative consequences of mistakes, going on tilt and being harassed, limited emotional regulation, dwelling on past performance, performance pressure, confidence issues, flow repetition, inadequate preparation, lack of team reliance, ineffective communication, difficulty separating life and gaming, lack of commitment to gaming, and limited game understanding. Techniques included playing smart, playing forward, staying motivated, staying in the moment, mitigating tilt and harassment, mindset

					monitoring, pre-performance routines, competitor adaptation, team reliance, effective communication, and team building.
Hong and Connelly (2022), UK	To investigate esports players' coping skills and strategies to enhance their physical and mental health during their esports career.	Transactional Model of Stress and Coping (Lazarus & Folkman, 1984)	33 esports players (21 professional, 6 semi-professional, 4 amateur, 2 retired players) M_{age} = NR (range 17–36) $M_{experience}$ = NR $M_{gameplay/week}$ = NR	Semi-structured interviews covering background of esports career, general player experience, challenges and difficulties, coping skills and strategies.	Stressors included physical fatigue and mental fatigue. Coping strategies included lifestyle balance (e.g. engaging in other activities), seeking social support, and sleep management.
Hussain et al. (2021), USA	To understand the motives and lived experiences of esports' Muslim woman participants from Gilgit-Baltistan, Pakistan.	Uses and Gratification thory (Blumler, 1979)	9 female tournament players from a variety of esports M_{age} = 22.00 (3.08) years $M_{experience}$ = NR $M_{gameplay/week}$ = NR	Observations and semi-structured interviews on players behaviors including the selection and creation of gaming avatars, teamwork, participants gaming strategy, and communication during gameplay.	Stressors included the embodiment of whiteness (i.e. unconscious embodiment of the dominant discourse in the social setting), reception of sexualized messages, and experience of discrimination.
Leis et al. (2022), GER	To provide insights into stressors experienced by professional LoL players, perceived stress responses, and coping strategies.	Meta-model of stress, emotion, and performance (Fletcher et al., 2006)	12 professional male LoL players M_{age} = 21.83 (2.85) years $M_{experience}$ = 8.83 (1.52) years $M_{gameplay/week}$ = *56.92 (20.61)* hrs	Semi-structured interview covering players experience related to stressors, perceived stress responses, and coping strategies.	Stressors included performance expectations (e.g. high-self expectations), internal evaluation (opponents performance), team issues (e.g. intra-team criticism), audience and social media (e.g. being the favorite team), and environmental issues (e.g. unprofessional environment). Coping strategies included social network (e.g. communicating with others), attention regulation (e.g. focusing on the game), self-regulation (e.g. imagery), increasing effort (e.g. analyzing games), consumption strategies (e.g. drinking coffee), and dissociation (e.g. stop talking to teammates).
Leis et al. (2023), GER	To investigate internal and external factors perceived by practitioners to negatively impact esports players'	NR	25 practitioners from a variety of esports (7 female; 8 performance coaches,	Survey study with participants asked to report the three main internal/external factors that negatively influence the	Internal factors negatively impacting performance most frequently included limited coping ability, lack of self-confidence, unhealthy

(*Continued*)

Table 2. Continued.

Study	Aim(s)	Theoretical framework	Participant information	Instrumentation	Key findings
	performance and explore stress management strategies used before and after competition.		3 sport psychologists, etc.) M_{age} = 28.84 (5.93) years $M_{experience}$ = 2.88 (2.60) years working in esports	performance of esports players and the three strategies that they most frequently use to support players experiencing stress [1–2 hrs, immediately before, immediately after, 1–2 hrs. after] a competitive match.	lifestyle, grinding mentality, and lack of attention. External factors most frequently included schedule issues, an unprofessional environment, performance pressure, communication issues, and team issues. Stress management included strategies such as imagery, breathing techniques, physical exercise, social support related to time of competition.
Pereira et al. (2021), BRA *	To develop a model to explore the association between distress and anxiety/depression symptoms and potential associations between adaptive or maladaptive coping strategies, sleep disturbance, alcohol consumption and eating habits in electronic football players.	NR	292 eFootball players (7 female; 18 professional) M_{age} = 27.00 (8.10) years $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Survey study including the Distress Screener, General Health Questionnaire, Brief Cope, Sleep Disturbance Domain of the Patient-Reported Outcomes Measurement Information System, three-item version of the Alcohol Use Disorders Identification Test Consumption (AUDIT-C), and questions on eating habits.	Relationships included distress correlating with anxiety and depressive symptoms. Maladaptive coping strategies were related to sleep disturbance, alcohol consumption, and poor eating habits, while adaptive coping was associated with less sleep disturbance, reduced alcohol consumption, and better eating habits.
Pereira et al. (2022), BRA *	To investigate the association between measurements of Big Five Factor and coping strategies in LoL players.	Big Five / Big Five Factors (John & Srivastava 1999)	138 Brazilian LoL players (7 female) M_{age} = 21.24 (3.77) years $M_{experience}$ = 5.12 (1.71) years playing professional $M_{gameplay/week}$ = 27.97 (26.70)	Survey study including the Big Five Inventory – 2 (BFI-2) and Athletic Coping Skills Inventory-28 (ACSI-25BR).	Conscientiousness indicated the use of coping strategies focused on emotion, while neuroticism was related with the skills of coping with adversity, motivation, and free from worries.
Polat et al. (2023), TURK	To understand the stress experience of players and the type of coping methods they use.	Transactional Model of Stress and Coping (Lazarus & Folkman, 1984)	8 University team esports players M_{age} = range 18–20 $M_{experience}$ = NR $M_{gameplay/week}$ = NR	Focus-group interviews with a semi-structured interview guide covering stressors and coping strategies among esports players.	Stressors included excitement before matches, individual performance concerns, opponents performance, lack of communication between the team, and desire to win the match. Coping strategies included emotion-focused coping (e.g. listening to music), problem-

					focused (e.g. discussing the game), avoidance- (e.g. avoiding communication), and approach coping (e.g. changing style of playing), and search for support (e.g. communicating with other players).
Poulus et al. (2020), AUS *	To explore stress and coping in esports athletes and the influence of mental toughness.	Cognitive-motivational-relational theory of stress (Lazarus, 2000); 4/6Cs Model of Mental Toughness (Clough et al., 2002)	316 esports athletes from a variety of esports (33 female) M_{age} = 22.61 (4.35) years $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Survey including stress appraisal via analog scales, Brief COPE inventory (Carver, 1997), Mental Toughness Index, Mental Toughness Questionnaire 6 (MTQ6).	Stressors included technical issues and antisocial behavior. Coping strategies highlighted greater use of problem-focused coping (mastery coping) than emotion focused and avoidance coping (internal regulation). Mental toughness was associated with greater use of problem- and emotion-focused coping and less avoidance coping strategies. Mental toughness was also associated with perceived control, while MTQ6 subscales were associated with stress intensity.
Poulus et al. (2022a), AUS	To qualitatively investigate the perceived determinants of success in professional esports athletes.	Bioecological Model (Bronfenbrenner & Morris, 2006)	7 elite/professional male players from a variety of esports M_{age} = 24.0 (4.20) years $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Semi-structured interviews covering the participants mindset when playing well, mental strategies used and their perceived effectiveness, experienced stressors, coping strategies, training, skill and knowledge development, coach-athlete relationship, and challenges in esports teams.	Mental strategies were used by players to regulate their emotions and remain mindful in the presence of 'tilt', while breathing techniques and tactical breaks were used to manage nervousness or facilitate a 'reset' during stressful situations. Players also reported using strategies to improve team cohesion, with the main challenge being interpersonal disagreements.
Poulus et al. (2022b), AUS *	To examine the stressors, stress appraisal, coping, and coping effectiveness by elite esports players.	Cognitive-motivational-relational theory of stress (Lazarus, 2000)	6 elite male LoL players … M_{age} = 21.00 (1.90) years $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Longitudinal online diary study (weekly over 87 days) on stressors experienced, stressor intensity, and threat/challenge appraisal, coping strategies used, and perceived coping effectiveness.	Stressors included general performance, outcome, critical moment performance, and teammate mistakes accounting for 55% of the stressors reported. Competitive diaries noted more stressors compared to training diaries, with competitive stressors

(*Continued*)

Table 2. Continued.

Study	Aim(s)	Theoretical framework	Participant information	Instrumentation	Key findings
					rated as more intense. While overall challenge and threat appraisals showed no difference, performance stressors tended to be seen as challenge, while teammate stressors were more likely perceived as threats. Problem-focused coping (mastery coping) was the most frequently used coping strategy., and both problem-focused and emotion-focused coping (internal regulation) were considered more effective at reducing stress than avoidance coping (internal regulation).
Poulus et al. (2022c), AUS	To explore the sources of stress experienced by competitive esports athletes.	Cognitive-motivational-relational theory of stress (Lazarus, 2000)	270 esports players from a variety of esports M_{age} = 22.40 (4.12) years $M_{experience}$ = NR $M_{gameplay/week}$ = *NR* 86.3% non-professional	Cross-sectional survey with participants asked to list a single stressor they had encountered recently when competing in an open-ended stressor box.	Stressors included performance (general performance, outcome, critical moment performance, injury), teammate (teammate communication, teammate mistake, teammate general, anti-social behavior, criticism), external individuals (crowd, coach, official, opponent), balancing life commitments, and technical issues.
Ruvalcaba et al. (2018), USA *	To understand female gamers' experiences with positive and negative feedback and sexual harassment in esports.	NR	Study 1: 92 gamers (61 female) M_{age} = NR (NR) years $M_{experience}$ = 3.43 (1.37) years $M_{gameplay/week}$ = 4.90 (5.66) hours Study 2: 87 Twitch streaming players (39 female)	Study 1:Survey study 13 questions on time spent playing, frequency of interaction with others (1–10), and questions on praise/criticism from male/female gamers. Study 2: Observation study Text from chat during Twitch streams (14.284 chat messages).	No gender difference was observed in receiving criticism among gamers and in negative comments directed at female (1.6%) and male streamers (1.8%). Female streamers received a higher proportion of sexual harassment comment (1.83%) than male streamers (0.18%).
Sabtan et al. (2022), CAN	To investigate current coaching practices and challenges in LoL professional teams.	NR	4 head coaches, 1 analyst, 1 general manager (1 female) M_{age} = 28.80 (NR) years	Interviews covering performance assessment methods, training, general game knowledge, and challenges a coach faces in esports.	Challenges included long practice hours, player attitudes, mental stress, and other health concerns such as back and wrist injuries.

			$M_{experience}$ = NR $M_{gameplay/week}$ = *NR*		
Schubert et al. (2022), BEL	To shed light on the perceptions of doing and performance-enhancing substances in professional esports players.	Classification of doping and enhancement in sport subject to legality and (perceived) legitimacy (Schubert & Könecke, 2015)	9 male professional esports players in the 'bevestor Virtual Bundesliga Club Championship' M_{age} = NR (range 18–27) $M_{experience}$ = NR $M_{gameplay/week}$ = *NR*	Semi-structured interviews covering esports knowledge, perceptions about esports and FIFA, knowledge and experience with performance-enhancing practices, and anti-doping efforts.	Stressors included high-performance pressure, a volatile playing field (annual rhythm with new releases, patches, and relearning), and rather a low prize money with qualification tournaments.
Smith et al. (2019), UK	To extend an understanding of the stressors that esports players experience and coping strategies players use to deal with these stressors.	Transactional Model of Stress and Coping (Lazarus & Folkman, 1984)	7 male CS:GO players M_{age} = 20.57 (2.07) years $M_{experience}$ = 3.43 (1.37) years $M_{gameplay/week}$ = *NR*	Semi-structured interviews covering stressors and coping strategies during the competition weekend and general competitive experience.	Stressors included team issues (e.g. communication issues, intra-team criticism), individual issues (life balance and difficulty with managing lifestyle), scrutiny and criticism (opposition and social media), and event issues (e.g. event audience and media interviews). Coping strategies were organized into five forms: emotion-focused- (e.g. exercise), problem-focused- (e.g. communicating with teammate), approach- (e.g. non-game related group activities), avoidance-(e.g. not doing interviews), and appraisal coping (e.g. re-framing comments from teammates).
Smith et al. (2022), UK *	To examine the predictors of mental ill health in esports athletes.	NR	313 competitive university level esports athletes from a variety of esports (30 female) M_{age} = 19.80 (2.00) years $M_{experience}$ = 2.80 (4.90) years $M_{gameplay/week}$ = *NR*	Survey including an own stressors measure, Pittsburgh Sleep Quality Index, Athlete Burnout Questionnaire, Social Phobia Inventory, General Health Questionnaire – short form, Patient Health Questionnaire, and Distress Screener.	Stressors significantly predict sleep quality, burnout, and social phobia anxiety. Stressors, sleep quality, burnout, and social phobia anxiety were positive predictors of mental ill health.

Note. Studies highlighted with asterisk indicate those that examined the relationship between stressors, coping, and additional constructs. POL = Poland; USA = United States of America; UK = United Kingdom; GER = Germany; BRA = Brazil; TURK = Turkey; AUS = Australia; CAN = Canada; BEL = Belgium; NR = not reported; CS:GO = Counter-Strike: Global Offensive; LoL = League of Legends.

studies (Behnke et al., 2021; Pereira et al., 2021; Pereira et al., 2022; Poulus et al., 2020; Ruvalcaba et al., 2018; Smith et al., 2022), one observational (Ruvalcaba et al., 2018), and one diary study (Poulus et al., 2022b). Some of these studies employed a combination of methods.

Study focus

The stressor and coping studies' research questions focused on various aspects, such as situations eliciting positive and negative emotions (Behnke et al., 2021), stressors and coping strategies (Leis et al., 2022; Poulus et al., 2022c; Smith et al., 2019), and challenges in professional esports teams (Sabtan et al., 2022). Four studies exclusively focused on competitive contexts (Leis et al., 2022, 2023; Poulus et al., 2022b; Smith et al., 2019), whereas 11 studies focused on aspects such as challenges experienced by players relating to training and competition.

On the other hand, the seven studies on relationships focused on esports in general, including training and competitive contexts (Behnke et al., 2021; Pereira et al., 2021; Pereira et al., 2022; Poulus et al., 2020; Poulus et al., 2022b; Ruvalcaba et al., 2018; Smith et al., 2022). The studies focused on the relationship between emotions and gaming situations, distress, anxiety/depression symptoms, big five personality traits, mental toughness, stress, stress appraisal, coping effectiveness, predictors of mental ill health, and feedback and sexual harassment, including coping strategies, in esports.

Sample characteristics

Among the 15 studies focused on stressors and coping strategies, sample sizes varied, ranging from 5 to 652 participants, with an average of 93.3 participants ($SD = 183.1$). Gender information was absent in one study (Polat et al., 2023), but the majority of studies predominantly included male esports players (89%), with none including non-binary participants. Four out of 15 studies did not report the mean age of their sample (Cote, 2017; Hong & Connelly, 2022; Polat et al., 2023; Sabtan et al., 2022). Among studies that did report the average age, the average age of the participants was 22.8 years ($SD = 3.1$). Moreover, 11 studies did not provide information on player experience, and 13 studies lacked detail on weekly playing time. Among studies with available data, the average playing experience was 4.4 years ($SD = 2.4$), and the mean weekly playing time was 38.3 h ($SD = 26.4$). The participants engaged in League of Legends ($n = 10$), Counter-Strike: Global Offensive ($k = 7$), Defense of the Ancient 2 ($k = 4$), Overwatch ($k = 4$), Rainbox Six Siege ($k = 5$), FIFA ($k = 4$), Tekken ($k = 3$), Pro Evolution Soccer ($k = 2$), Streetfighter ($k = 2$), PUBG ($k = 2$), Fortnite ($k = 2$), and Valorant ($k = 2$).

The number of participants across the seven studies ranged from 6 to 617 participants, with an average of 258.7 participants ($SD = 212.1$). The total participant pool across all studies was 1804, with 162 female players (12%). No study reported non-binary participants. The participants had an average age of 22.1 years (2.6). Three out of seven studies reported player experience ($M = 4.4$ years; $SD = 3.6$), and two studies acknowledged the hours spent playing per week ($M = 23.8$; $SD = 23.3$). Participants were involved in various esports, including League of Legends ($k = 3$), Counter-Strike: Global Offensive ($k = 4$), Overwatch ($k = 2$), Defense of the Ancient 2 ($k = 2$), Rainbox Six Siege ($k = 2$), FIFA ($k = 2$), Valorant ($k = 1$), HeartStone ($k = 1$). For a brief description of included esports games, please see supplementary material.

Categorization of stressors and coping strategies

Categorization of stressors

Stressors reported across the 15 studies were categorized into performance, team, social, organizational, and personal stressors (e.g., Didymus et al., 2021). Performance stressors emerged as the most frequently reported stressor, including defeat ($k = 9$), performance pressure ($k = 5$; negative evaluation and emotional response to insufficient performance for goal achievement), expectations to win ($k = 5$), opponents' performance ($k = 5$), game changes and meta shifts ($k = 5$), and equipment challenges ($k = 5$). Team stressors, including communication challenges ($k = 7$), unfavorable team plays ($k = 5$), antisocial behavior ($k = 5$), and intra-team conflicts ($k = 4$), were less frequently reported. Social stressors encompassed audience reactions ($k = 5$), social media and public perception ($k = 4$), online harassment and toxicity ($k = 3$), external judgement (e.g. fans, opponents, and casters; $k = 3$), media interviews ($k = 2$), and interactions with officials ($k = 1$). Organizational stressors included unprofessional environment ($k = 3$), travel and transportation challenges ($k = 3$), schedule and time conflicts ($k = 2$), and organizational expectations ($k = 2$). Personal stressors, comparatively less frequently reported, included balancing life commitments (e.g. difficulties separating life from gaming, organizing study around practice and competition; $k = 5$) and job insecurities ($k = 2$). Table 3 presents the stressors mentioned in the identified studies, categorized according to the overarching stressor categories.

Categorization of coping strategies

Coping strategies reported across the 19 identified studies were classified into three main categories: mastery coping, internal regulation, and goal withdrawal (Nicholls et al., 2016). Internal regulation emerged as the most frequently mentioned coping strategy (see Table 4), followed by mastery coping, while goal withdrawal strategies were comparatively less prevalent. In managing internal responses to stress (i.e. internal regulation), players commonly engaged in team interactions ($k = 5$), communication with teammates, friends, and family ($k = 4$), avoidance behaviors (e.g. not doing interviews, not reading social media; $k = 4$), as well as meditation techniques ($k = 4$). Other strategies, such as non-game related activities, team support, and utilizing humor ($k = 3$, each) were also commonly mentioned. Mastery coping, focused on controlling situations and eliminating stressors, involved physical activity (warm-up, stretching, exercise; $k = 5$), self-focus in gaming, attention management, addressing issues to teammates and coaches, and employing techniques to block harassers ($k = 4$, each). The most recurrent goal withdrawal strategies included players resorting to substance use ($k = 3$) and venting negative emotions ($k = 2$).

Explored associations

This section investigates the relationships of stressors and coping strategies among identified studies with other constructs, including appraisals (Poulus et al., 2020: Poulus et al., 2022a), gender (Ruvalcaba et al., 2018), personality (Pereira et al., 2021; 2022), emotional responses (Behnke et al., 2021) and health outcomes (Pereira et al., 2021; Smith et al., 2022). Focusing on stress appraisal, Poulus et al. (2020) found that players more frequently appraised stressors as a challenge ($M = 6.2$; $SD = 2.6$) than a threat ($M = 4.1$; $SD = 3.0$). Expanding on this, Poulus et al. (2022a) noted that team stressors were more likely to

Table 3. Stressors within Identified Studies.

Stressors	Study	Stressor category
Defeat	1, 2, 4, 5, 6, 8, 9, 10, 14	Performance stressor
Performance pressure	3, 6, 11, 13, 15	
Expectations to win	1, 6, 8, 11, 13	
Opponents' performance	6, 8, 9, 10, 14	
Game changes and meta shifts	4, 7, 11, 13, 15	
Equipment challenges	6, 9, 11, 12, 14	
Preparation shortcomings	3, 7, 12, 14	
Live audience performance	6, 11, 12, 13	
Lack of control and focus	3, 7, 10	
Game-specific worries	10, 12, 15	
Worry of underperformance	6, 8, 13	
Dwelling on past performance	1, 3, 10	
Technical challenges (e.g. lags, bugs, trolls, hackers)	1, 9, 11	
Tilt	1, 6	
In-game deaths	1, 2	
Critical moment pressure	9, 10	
Dealing with mistakes	1, 9	
Injuries	9, 12	
Lack of game understanding	3, 7	
Lack of values, empathy, motivation, experience	3, 7	
Clutch situations	11	
Coping with substance use	12	
Overemphasis of grinding	7	
Communication challenges	1, 3, 8, 9, 10, 11, 14	Team stressor
Unfavorable team plays	1, 6, 9, 11, 14	
Antisocial behavior	1, 2, 6, 9, 11	
Intra-team conflicts	1, 6, 10, 15	
Underperforming teammates	1, 6, 14	
Lack of teammate effort	10, 14	
Stats vs. team success dilemma	11, 14	
Emotional teammates in failure	1, 11	
Worry about teammate judgement	6, 12	
Criticism of mistakes	7, 11	
IGL communication style	14, 15	
Lack of team support	3, 7	
Unclear game plan / decisions	14	
Audience reactions	6, 7, 8, 9, 14	Social stressors
Social media and public perception	6, 9, 12, 14	
External judgement (e.g. fans, casters)	6, 12, 14	
Online harassment and toxicity	2, 5, 14	
Media interviews	6	
Interactions with officials	9	
Unprofessional environment	6, 7, 13	
Travel and transportation challenges	6, 7, 14	
Schedule and time conflicts	7, 14	Organizational stressor
Organizational expectations	14	
Coaching pressure	12	
Limited training hours	6	
Excessive practice	6	
Jetlag	6	
Limited prize money	13	
Lack of personal development resources	7	
Balancing life commitments	3, 9, 10, 11, 14	Personal stressors
Job insecurities	7, 12	
Psychological safety	7, 14	
Esports career commitment	14	
Limited prize money	13	
Sleep habits during practice	14	
Personal concerns	15	

Note. 1 = Behnke et al. (2021); 2 = Cote (2017); 3 = Himmelstein et al. (2017); 4 = Hong and Connelly (2022); 5 = Hussain et al. (2021); 6 = Leis et al. (2022); 7 = Leis et al. (2023); 8 = Polat et al. (2023); 9 = Poulus et al. (2022b); 10 = Poulus et al. (2022a); 11 = Poulus et al. (2022c); 12 = Sabtan et al. (2022); 13 = Schubert et al. (2022); 14 = Smith et al. (2019); 15 = Smith et al. (2022).

Table 4. Coping Strategies within Identified Studies.

Coping strategies	Study	Coping category
Communication	4, 6, 8, 14	Internal regulation
Team interaction	6, 7, 14, 18	
Avoidance behaviors	2, 6, 8, 14	
Meditation	4, 6, 7, 12	
Breathing exercises	6, 7, 10	
Non-game related activities	4, 6, 14	
Going to the gym	6, 7, 12	
Taking breaks	4, 8, 14	
Team support	2, 6, 14	
Humor	6, 17, 18	
Self-distraction	17, 18	
Acceptance	17, 18	
Self-talk	6, 7	
Music	6, 7	
Religion	17, 18	
Sleep	4, 6	
Sarcasm	2	
Partying	6	
Cold showers	6	
Emotional eating	14	
Walking	7	
Massage	7	
Physical activity	2, 6, 7, 10, 14	Mastery coping
Blocking harassers	2, 12, 17, 18	
Self-focus in gaming	2, 6, 8, 16	
Attention management	10, 14, 17, 18	
Address issues to teammates and coaches	4, 6, 8, 14	
Goal setting	4, 17, 18	
Strategic planning	2, 6, 14	
Lifestyle balance	3, 7, 16	
Adaptive play style	3, 7, 8	
Intensity increase	6, 8	
Skill and expertise reliance	3, 8	
Nutrition support (e.g. coffee, energy drinks, water, fruits)	6, 8	
Forward-oriented play	3	
Team dynamic building	10	
Performance analysis	2	
Sleep optimization	6	
Tactical breaks	7	
Mental training	10	
Instrumental support	12	
Calculated use of flirtations	2	
Substance use (e.g. alcohol, tobacco)	6, 17, 18	Goal withdrawal
Venting negative emotions	17, 18	
Leaving the team	14	
Leaving online gaming	2	
Behavioral disengagement	17	
Not playing aggressively	14	
Microphone muting	14	
Avatar selection	5	
Avoid using overtly feminine usernames	5	

Note. 1 = Behnke et al. (2021); 2 = Cote (2017); 3 = Himmelstein et al. (2017); 4 = Hong and Connelly (2022); 5 = Hussain et al. (2021); 6 = Leis et al. (2022); 7 = Leis et al. (2023); 8 = Polat et al. (2023); 9 = Poulus et al. (2022b); 10 = Poulus et al. (2022a); 11 = Poulus et al. (2022c); 12 = Sabtan et al. (2022); 13 = Schubert et al. (2022); 14 = Smith et al. (2019); 15 = Smith et al. (2022); 16 = Pereira et al. (2021); 17 = Pereira et al. (2022); 18 = Poulus et al. (2020).

be appraised as a threat, whereas performance stressors were predominantly appraised a challenge. In addition, a higher prevalence of stressors was observed in competitive than training settings (Poulus et al., 2022a). Poulus et al. (2020) reported an average stress intensity of 6.4 ($SD = 2.3$) and an average perceived control of 3.9 ($SD = 2.9$). Moreover,

perceived stress intensity was negatively associated with mental toughness, while perceived control was positively associated with mental toughness (Poulus et al., 2020).

Regarding gender dynamics stressors among esports players, Ruvalcaba et al. (2018) explored feedback and sexual harassment differences. Despite most comments being neutral for male (96%) and female streamers (93%), female streamers received more positive feedback directed towards themselves (3%) and appearance-related compliments (37%) compared to males (1% and 8%, respectively). This feedback coexisted with a higher incidence of sexual comments for female streamers (approximately 2% vs. 0%).

Stressors also impact emotional responses and mental health outcomes (Behnke et al., 2021; Smith et al., 2022). Behnke et al. (2021) found that anger and sadness are related to performance and team stressors. Specifically, they found anger was associated with team issues (43%), negative performance outcomes (28%), and opponents' actions (20%), while sadness was primarily associated with negative performance outcomes (45%) and underperforming (25%). Examining stressors, including team and performance stressors, Smith et al. (2022) identified a negative impact on sleep quality and a positive prediction for burnout and social phobia anxiety. The most influential predictors across the three social phobia anxiety components were personal concerns and in-game pressure (27% fear, 16% avoidance, 16% physiological symptoms).

With a focus on coping strategies, Pereira et al. (2021) observed that both effect sizes were small, with a stronger association of maladaptive coping with anxiety symptoms ($r = 0.14^{**}$) compared to adaptive coping ($r = -0.06^{**}$). The coping strategies categorized as maladaptive coping also correlated with sleep disturbances, alcohol consumption and poor eating habits (i.e. internal regulation, goal withdrawal), whereas adaptive coping related to better sleep, reduced alcohol intake, and healthier eating habits (i.e. mastery coping). Another study found several personality factors were positively associated with the Athletic Coping Skills Inventory-28 (ACSI-25BR) dimensions, with conscientiousness related to emotion-focused coping (internal regulation) and neuroticism correlating with coping skills for adversity, motivation, and being worry-free (Pereira et al., 2022).

Quality assessment

The quality assessment of the 19 studies against nine criteria generally suggests good quality of the included studies. Across all criteria, studies received a range of two to nine 'yes' ratings ($M = 6.4$, $SD = 2.3$), zero to five 'no' ratings ($M = 1.4$, $SD = 1.5$), and zero to five 'unclear' ratings ($M = 1.2$, $SD = 1.4$), as shown in Table 5. Specifically, the methodological appropriateness (item 1) and reporting of results (item 7) received 18 'yes' ratings and one 'unclear' rating each. However, six 'no' scores were reported for the theoretical framework (item 2) and participant characteristics (item 3), while eligibility criteria (item 4) and control of confounding variables (item 8) received five 'no' scores each. Overall, studies demonstrated variability in meeting the nine criteria, highlighting areas for consideration in the interpretation of the findings.

Discussion

The purpose of this systematic review was to provide an overview of the existing literature on stressors and coping strategies in esports, while demonstrating their relationship with

Table 5. Quality Assessment.

Study	1	2	3	4	5	6	7	8	9	Yes ratings	No ratings	Unclear ratings
Behnke et al. (2021)	✓	O	✓	O	✓	✓	✓	O	✓	6	0	3
Cote (2017)	O	X	X	✓	X	X	✓	X	O	2	5	2
Himmelstein et al. (2017)	✓	O	✓	✓	✓	✓	✓	O	✓	7	0	2
Hong and Connelly (2022)	✓	✓	X	X	✓	✓	✓	✓	✓	7	2	0
Hussain et al. (2021)	✓	✓	✓	✓	O	✓	✓	X	X	6	2	1
Leis et al. (2022)	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0	0
Leis et al. (2023)	✓	X	✓	✓	✓	✓	✓	O	✓	7	1	1
Pereira et al. (2021)	✓	X	✓	✓	✓	✓	✓	✓	✓	8	1	0
Pereira et al. (2022)	✓	✓	✓	X	✓	✓	✓	X	✓	7	2	0
Polat et al. (2023)	✓	✓	X	X	X	O	✓	X	O	3	4	2
Poulus et al. (2020)	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0	0
Poulus et al. (2022a)	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0	0
Poulus et al. (2022b)	✓	✓	✓	X	✓	✓	✓	✓	✓	8	1	0
Poulus et al. (2022c)	✓	✓	✓	✓	O	✓	✓	O	✓	7	0	2
Ruvalcaba et al. (2018)	✓	X	X	O	X	O	✓	X	✓	3	4	2
Sabtan et al. (2022)	✓	X	X	✓	O	O	O	O	O	2	2	5
Schubert et al. (2022)	✓	✓	X	✓	O	O	✓	✓	✓	6	1	2
Smith et al. (2019)	✓	✓	✓	✓	✓	✓	✓	✓	✓	9	0	0
Smith et al. (2022)	✓	X	✓	X	✓	✓	✓	O	✓	6	2	1
Total yes scores	18	11	13	12	12	14	18	8	15			
Total no scores	0	6	6	5	3	1	0	5	1			
Total unclear scores	1	2	0	2	4	4	1	6	3			

Note. 1 = Methodological appropriateness; 2 = Theoretical framework; 3 = Participant characteristics; 4 = Eligibility criteria; 5 = Measurements; 6 = Data analysis; 7 = Reporting of results; 8 = Control for confounding and verification procedures; 9 = Acknowledgement of limitations.
✓ = denotes criterion is met; X = denotes criterion is not met; O = denotes unclear if criterion is met.

related constructs such as appraisals and gender. Adhering to the PRISMA guidelines (PRISMA; Page et al., 2021) and guidelines for systematic reviews in the field of sport and exercise psychology (Gunnell et al., 2020; Gunnell et al., 2022), we synthesized findings from 19 studies. Specifically, performance stressors, notably performance pressure, emerged as the most frequently reported stressor, along with team stressors, social stressors, organizational stressors, and personal stressors. The predominant coping classification used was internal regulation (e.g. communicating with teammates) and mastery coping (e.g. increasing effort). Goal withdrawal strategies, such as venting negative emotions, were infrequently reported. While this review demonstrates the association between stressors and psychological aspects (e.g. anger, sadness, sleep quality, burnout), and coping strategies with psychological factors (e.g. mental toughness, personality traits), there remains limited depth in understanding mediating and moderating factors. For example, the competitive characteristics of participants, such as their levels of competition (e.g. amateur, professional), roles (e.g. players, streamers), and specific esports contexts, can influence the stress and coping process. Advancing our current understanding of stressors and coping strategies in esports is needed to develop targeted interventions that support esports players' well-being and performance in the competitive environment.

Comparison with traditional sports reveals parallels in experienced stressors. Specifically, similarities include performance stressors (e.g. inadequate preparation, injury, underperformance, opponent rivalry, and self-presentation), team issues (e.g. teammates behaviors, personality, and goals), organizational stressors (e.g. schedule and time conflicts), and personal stressors (e.g. academic commitments, balancing personal commitments with a job; e.g. Arnold & Fletcher, 2012; Arnold & Fletcher, 2021; Sarkar &

Fletcher, 2014). In contrast to athletes who frequently report organizational stressors associated with leadership and other personnel (e.g. Arnold & Fletcher, 2012; Simpson et al., 2021), esports literature seldom addresses these stressors (e.g. Smith et al., 2019). This disparity may be attributed to factors such as characteristics of study samples, research questions, and variations in leadership models within esports (e.g. shared leadership). Despite limited evidence on stressors such as in-game leader communication style (Smith et al., 2019; Smith et al., 2022) and interactions with officials (Poulus et al., 2022b), it is reasonable to assume that team-based esport players also experience stressors associated with leadership and other personnel. Noteworthy among the more unique stressors presented in esports research are social media pressures, online harassment, toxicity, game changes, meta shifts, and equipment challenges. Highlighting the differences, social stressors were a category developed based on this review to encompass stressors not fitting into existing categories such as organizational stressors, including interactions outside the organization (e.g. social media).

While personal stressors remain underexplored in esports studies, they are presumed to align with those experienced by traditional athletes. The lack of personal stressors in identified studies may be attributed to their specific focus, such as interview guides focusing on competition-related stressors (e.g. Leis et al., 2022). Additionally, while traditional sports stressors, such as weather conditions (e.g. Nicholls et al., 2006; Weston et al., 2009) may not directly translate to the esports environment. However, esport players may experience temperature-related issues due to heating in venues or restrictions on outdoor breaks during series warranting further research (Yeganeh et al., 2018).

Moreover, similar coping strategies emerge in esports players and traditional athletes, including communication, team interaction, physical activity, and mental strategies such as self-talk and meditation. Both esports research (e.g. Leis et al., 2022; Polat et al., 2023; Smith et al., 2019) and sports research emphasize the role of social networks in coping (e.g. Leprince et al., 2018; Weston et al., 2009). While esport players and athletes share coping strategies such as concentration, effort, planning, self-talk, and acceptance, they less frequently resort to goal withdrawal strategies (e.g. Didymus & Fletcher, 2014; McGreary et al., 2021; Swettenham et al., 2020). Noteworthy differences, such as microphone muting and avatar selection, are attributed to the distinctive esports environment (Hussain et al., 2021; Smith et al., 2019). The present findings also align with research in traditional sports, indicating a higher prevalence of mastery coping compared to internal regulation and goal withdrawal strategies (e.g. Simpson et al., 2021). Due to the lack of research on the efficacy of coping strategies in esports, no meaningful comparison with findings from traditional sports research can be made.

Research on sports athletes has highlighted five key psychological factors protecting them from stressors' potential negative effects: personality, motivation, confidence, focus, and perceived social support (Sarkar & Fletcher, 2014). In esports, the importance of perceived social support in esports is indicated, particularly through the number of internal regulation strategies related to the player's team (e.g. communication with teammates, relying on teammates, team environment; e.g. Leis et al., 2022; Smith et al., 2019). In contrast to sport research, current esports research is limited to multiple components of the transactional stress process, including appraisals (e.g. Bartholomew et al., 2017; Didymus & Fletcher, 2017), coping (e.g. Arnold et al., 2017; Didymus & Fletcher, 2017), performance (see meta-analysis by Nicholls et al., 2016), personality (including adaptive

perfectionism, optimism, competitiveness, hope and proactivity; see review by Sarkar & Fletcher, 2014), and self-confidence (see meta-analysis by Jekauc et al., 2023). Similarly, while existing evidence in traditional sport has explored variations in factors such as age, gender, and sports types (e.g. Nicholls & Polman, 2007; Simpson et al., 2021), a gap exists in the study of similar distinctions among esports players.

Limitations

Theoretical and methodological limitations in identified studies

A notable limitation of the present review is the paucity in this domain, in comparison to traditional sports. The lack of studies impairs the comprehensive understanding of how esports players assess stressors within the esports environment and tailor their coping responses accordingly. A more detailed understanding is further limited by several of the included study's research questions that specifically focused on stressors and coping in the competitive environment. Since the identified studies primarily focused on esports players' experiences of the competitive environment, insights into personal stressors are limited. However, understanding personal stressors seems of particular importance as a professional career in esports is considered highly difficult (Salo, 2017; Smithies et al., 2020) with players struggling to balance life commitments and esports (Poulus et al., 2022b, 2022c). Similarly, research on shared stressors (demands experienced by two or more players within a team) and communal coping strategies (collective efforts to manage a stressor) is limited, restricting understanding of how players collectively appraise and navigate stressors in esports. There also remains a limited understanding of the impact of factors such as age, gender (especially among female gamers), cultural context, and experience on appraisal and coping. Moreover, the quality assessment of the included studies underscored deficiencies in reporting regarding a theoretical framework, participant characteristics, eligibility criteria, and control for confounding variables. These limitations, in turn, constrain the interpretation of their findings.

Limitations within this review

The review's findings were influenced by the eligibility criteria, encompassing language, topic, publication status, and sample characteristics. Exclusions were made for studies lacking specificity on the video game under consideration, thereby excluding research addressing stressors and/or coping within the broader context of online gaming. For instance, research has shown a range of stressors and coping strategies associated with general and sexual harassment (e.g. Fox & Tang, 2017; McLean & Griffiths, 2019). Experimental designs were also excluded in line with the methodological scope (e.g. Behnke et al., 2020), focusing on previous research on stress responses through experimental designs (Leis & Lautenbach, 2020). The review's emphasis on stressors and coping among esports players omitted insights into other populations, such as esports coaches (e.g. coaches in sport: Norris et al., 2017). Additionally, the focus on amateur and professional players limits the generalizability of conclusions across specific levels of performance. Although stressor and coping categories cover a broad range, specific nuances within these domains are underexplored in esports. Notably, potential errors in categorization arose from reliance on extracted information rather than direct access to the transcripts or raw data sheets, acknowledging the possibility for misclassifications.

For instance, the classification of 'partying' as internal regulation, despite its potential alignment with goal withdrawal, stems from its utilization by players for emotional regulation after victories and losses (Leis et al., 2022). Moreover, this review does not provide detailed insights into protective factors such as motivation, confidence, and perceived social support (Sarkar & Fletcher, 2014).

Future research

While this review offers valuable insights, several avenues remain limited, offering opportunities for future research. To advance the interpretation of future research, it is crucial for studies to define key terms, including stressors and coping. Drawing upon Lazarus and Folkman's (1984) definition, as presented in our introduction, provides a framework for conceptualizing stressors and coping strategies in esports. While Nicholls et al.'s (2016) framework could enhance the categorization of coping strategies, the stressor categories identified in this review (i.e. performance, team, social, organizational, and personal stressors) could foster a better understanding of stress and coping within esports. The development of the new category, social stressors, may enhance future research by addressing interactions outside the organization, such as social media, and providing a more holistic view of stress affecting performers. Furthermore, frameworks, as used in the present review, should be validated for future relevance, ensuring their applicability to evolving contexts. To enhance our understanding, contextual reporting of stressors and coping strategies is crucial. For a broader perspective, future research should examine stressors by considering the frequency, intensity, duration, perceived controllability, and severity (e.g. Arnold & Fletcher, 2021). Moreover, exploring personal stressors in greater detail can inform intervention strategies for players' personal development, well-being, and performance. Future research could enhance our understanding of stressors and coping by incorporating additional variables such as personality traits, motivation, self-confidence, perceived support, performance, and well-being. In addition, a dynamic approach could reveal how appraisal and coping strategies evolve over time in relation to personal and environmental factors. Studies should also differentiate among various levels of performance, considering the definition outlined by Bubna et al. (2023) regarding esport players and the classification system provided by Poulus et al. (in press). Existing theoretical frameworks, such as the meta-model (Fletcher et al., 2006) may be applied to better understand how appraisals, coping, and esports performance are related. Similarly, exploring the effectiveness of combined coping strategies, especially within specific player demographics (e.g. age, gender, cultural context, performance levels), can lead to tailored interventions (e.g. Crocker et al., 2015; Tamminen, 2021). For instance, the research highlighted the role of performance levels, stress appraisal, self-regulation, psychological skill use, and perceived social support in esports, pointing toward tailored interventions for specific populations (Poulus et al., 2023; Trotter et al., 2021, 2023). While initial steps have been taken in developing esports specific interventions, such as workshops to develop team cohesion (Swettenham & Whitehead, 2022) or adapting coping effectiveness training for esports contexts (Poulus et al., 2023), future research should refine and expand upon existing approaches. Exploring individual and collective appraisals and coping efforts, such as player-player, player-coach, and player-parent interactions, can yield valuable insights into the potential benefits of group-based

interventions. To facilitate these investigations, innovative and prospective designs (e.g. longitudinal studies, diary approaches, think-aloud protocols) can be applied to identify fluctuations in appraisal and coping strategies throughout the competitive season, drawing parallels with studies on athletes in rugby (Nicholls et al., 2006) and golf (Nicholls et al., 2005). In this regard, it is recommended that research follows established guidelines, ensuring adequate reporting of their methodologies, including aspects such as participant characteristics, eligibility criteria, and theoretical framework. This approach would enable more robust and nuanced interpretation of future research.

Practical implications

Effective intervention strategies should be tailored to individual players (Cottrell et al., 2019), encompassing the player's holistic environment, including coaches and staff (Henriksen et al., 2014). Given research indicating the efficacy of mastery coping in stress reduction (e.g. Nicholls et al., 2010), players may benefit from teachings on mastery coping (e.g. goal setting, attention management), supporting players to control and, thus, eliminate stressors (Nicholls et al., 2016). In contrast, avoiding goal withdrawal strategies during competitive events seems advisable due to their negative impact on coping effectiveness. Importantly, this process of change requires time and effort from players and, potentially sports psychologists (e.g. Henriksen et al., 2019). Interventions aimed at fostering trust, communication, and team cohesion can enhance perceived and available social support, supporting players in coordinating collective activities under pressure and openly communicating challenges. This approach facilitates collective problem-solving under pressure and encourages discussions among teammates, including interactions with sports psychologists, to refine strategies and address stressors such as online harassment and antisocial behavior (e.g. Swettenham & Whitehead, 2022). Practical initiatives, such as tailored workshops, can serve as effective initial steps in implementing these interventions (e.g. Leis et al., 2023). These workshops could prioritize discussions on effective communication, nutrition, and recovery strategies. For example, interventions could focus on enhancing team cohesion by fostering players' self-awareness and understanding of others through collaborative exploration of their individual strengths profiles (Swettenham & Whitehead, 2022). Encouraging non-game related activities, such as physical exercise (e.g. gym sessions and leisurely walks), weekly board game nights, watching movies, or engaging in hobbies, can positively contribute to player's overall well-being and team cohesion (e.g. Pedraza-Ramirez et al., 2024). Encouraging players to openly discuss performance, organizational, team dynamics, and personal stressors with researchers or stakeholders can help identify individual challenges and inform more inclusive intervention strategies.

Conclusion

Although research on stressors and coping in esports is limited, the present review provides an overview of the current state of research. The review highlights several performance, team, social, organizational, and personal stressors. Particularly notable is the addition of social stressors, which enriches the understanding of stressors in

this performance context. This study further emphasizes mastery, internal regulation, and goal withdrawal coping strategies in esports. Thereby, this review provides a practical resource for players and coaches and offers a starting point for future research on stressors and coping in esports. In conclusion, exploring appraisal and coping as a dynamic process with interpersonal elements, and different effectiveness across diverse populations while accounting for personal and environmental aspects can pave the way for targeted interventions that support performance and well-being in esports.

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Author contributions

Oliver Leis Conceptualization, Methodology, Study Selection Process, Data analysis, Risk of Bias Assessment, Writing – Original Draft, Project Administration; **Benjamin T Sharpe:** Methodology, Writing – Review & Editing; Critical Friend; **Vincent Pelikan:** Study Selection Process; **Julian Fritsch:** Quality Assessment, Writing – Review & Editing; **Adam Nicholls:** Critical Friend, Writing – Review & Editing; **Dylan R Poulus:** Methodology, Data Analysis, Writing – Review & Editing.

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