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REVIEW

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A systematic review and meta-synthesis of qualitative research investigating disordered eating and help-seeking in elite athletes

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Abstract

Objective: Elite athletes are at elevated risk for disordered eating and eating disorders; however, little is known about risk and maintaining factors, or barriers and facilitators of help-seeking in this cohort. This systematic review synthesized qualitative findings regarding possible risk and maintaining factors for disordered eating, as well as barriers to and facilitators of help-seeking in elite athletes.

Method: We conducted a search for qualitative studies that included experiences with body image concerns or disordered eating in elite athletes. A systematic search of CINAHL, PsychINFO, MEDLINE, and Scopus databases identified 828 articles, with 87 retained after title and abstract screening, and 38 included in the review. Quality appraisal was conducted using the checklist for appraising qualitative research (CASP). Data were extracted from each article, including demographic information (e.g., biological sex, age, sport type, level of competition, current, or former athlete) and the text under the "results" or "findings" section. Meta-themes were identified using inductive thematic meta-synthesis.

Results: The extracted data indicated that most studies sampled female athletes from the United States and UK. Eight meta-themes were identified: (1) the power imbalance; (2) hyperfocus on body, food, and exercise; (3) rigidity; (4) the athlete's balance; (5) the athlete identity; (6) overvaluation and oversimplification; (7) shame, fear, and stigma; and (8) knowledge, education, and self-identification.

Discussion: These findings highlighted gaps in the demographic representation of specific groups in this research (e.g., males, para-athletes, and ethnic diversity) and propose hypotheses of how sport pressure might contribute to athletes' experiences with disordered eating.

Public Significance: Disordered eating and body image concerns are prevalent and can have debilitating impacts for elite athletes; however, help-seeking is rare for this population. It remains unclear what factors contribute to disordered eating and/or inhibit help-seeking among elite athletes versus the general population.

Understanding athletes' perspectives will inform the modification of prevention and treatment strategies to address athlete-specific factors.

Abstract

Objetivo: Los atletas de élite tienen un riesgo elevado de presentar patrones alimentarios disfuncionales y trastornos de la conducta alimentaria; sin embargo, se sabe poco sobre los factores de riesgo y mantenimiento, así como las barreras y facilitadores para buscar ayuda en esta cohorte. Esta revisión sistemática sintetizó hallazgos cualitativos sobre posibles factores de riesgo y mantenimiento para conductas alimentarias disfuncionales, así como barreras y facilitadores para búsqueda de ayuda en atletas de élite.

Método: Realizamos una búsqueda de estudios cualitativos que incluyeran experiencias con preocupaciones sobre la imagen corporal o conductas alimentarias disfuncionales en atletas de élite. Una búsqueda sistemática en las bases de datos CINAHL, PsychINFO, MEDLINE y Scopus identificó 828 artículos, quedándonos con 87 después de la revisión de títulos y resúmenes, y 38 quedaron incluidos en la revisión. Se realizó una evaluación de calidad utilizando la lista de verificación para evaluar la investigación cualitativa (CASP). Se extrajeron datos de cada artículo, incluyendo información demográfica (por ejemplo, sexo biológico, edad, tipo de deporte, nivel de competencia, atleta actual o retirado) y el texto bajo la sección de "resultados" o "hallazgos". Se identificaron meta-temas utilizando la meta-síntesis temática inductiva.

Resultados: Los datos extraídos indicaron que la mayoría de los estudios incluyeron atletas femeninas de EE. UU. y Reino Unido. Se identificaron ocho meta-temas: (1) el desequilibrio de poder; (2) hiperenfoque en el cuerpo, la comida y el ejercicio; (3) rigidez; (4) el equilibrio del atleta; (5) la identidad del atleta; (6) sobrevaloración y simplificación excesiva; (7) vergüenza, miedo y estigma; y (8) conocimiento, educación y auto-identificación.

Discusión: Estos hallazgos destacaron brechas en la representación demográfica de grupos específicos en esta investigación (por ejemplo, hombres, para-atletas, diversidad étnica) y proponen hipótesis sobre cómo la presión deportiva podría contribuir a las experiencias de los atletas con conductas alimentarias disfuncionales.

KEYWORDS

athletes, disordered eating, eating disorders, qualitative, sport, systematic review

1 | INTRODUCITON

Athletes sit on a spectrum ranging from healthy eating and exercise behaviors, and healthy cognitions and perceptions of one's appearance, through to significant disturbances in these areas (i.e., disordered eating; Rodin et al., 1984). At the extreme, athletes may meet criteria for a clinical eating disorder (Wells et al., 2020). Elite athletes (i.e., competing nationally, internationally, professionally, or NCAA D1; Karrer et al., 2020) are at elevated risk for disordered eating, including eating disorders, versus non-athletes (Sundgot-Borgen & Torstveit, 2004). Prevalence estimates ranging widely depending on athlete context from 0% to 19% in male athletes, and 6%–45% in female athletes (Bratland-Sanda & Sundgot-Borgen, 2013; Reardon et al., 2019) versus approximately 2.2% and 8.4%, respectively, in the general population (Galmiche et al., 2019). Further, disordered eating and eating disorders may be more common in certain sports, typically those that promote a "lean" body as necessary for success, for example, esthetic sports (Chapa et al., 2022; Joy et al., 2016; Karrer et al., 2020; Mancine et al., 2020). Of concern, disordered eating is associated with many physical and mental health risks (Appolinario et al., 2022; Udo & Grilo, 2019), which may be exacerbated for elite athletes given their increased energy expenditure, fluid losses through perspiration, and overall strain on their body through training and competition. Despite this higher prevalence and debilitating impact on health and performance, limited research has investigated factors that might predispose, precipitate, or maintain disordered eating (i.e., referred to here generally as risk factors) in elite athletes specifically.

Disordered eating in elite athletes may be unique compared with the general population. First, the drive for thinness evident in the diagnostic criteria for anorexia nervosa and bulimia nervosa (Dell'Osso et al., 2016) may not resonate with some athletes who instead pursue muscular or lean body ideals due to sport or gender-related pressures (de Bruin & Oudejans, 2018; Galli & Reel, 2009). Second, most models of disordered eating developed in the general public purport body dissatisfaction as a key precipitating factor (Fairburn et al., 2003; Stice, 2001); however, these relationships may be complicated for athletes with findings that elite athletes who reported elevated disordered eating cognitions and behaviors also reported lower body dissatisfaction compared with non-athletes (De Bruin et al., 2007; Smolak et al., 2000; Torstveit et al., 2008). Indeed, athletes (including elite athletes) generally report lower body dissatisfaction than non-athletes (Smolak et al., 2000; Varnes et al., 2013). Thus, elite athletes may experience unique body ideals and cognitions about their bodies compared to the general population.

Additionally, elite athletes may be impacted by their unique experiences in the sporting environment. In the only proposed model for disordered eating developed specifically for athletes, Petrie and Greenleaf (2007) suggested eight risk factors/mediators, including (1) sport pressures; (2) societal pressures; (3) internalization; (4) body dissatisfaction; (5) negative affect; (6) restrained eating; (7) modeled behaviors by peers and family; and (8) binge eating and bulimia, derived from existing models of disordered eating in the general population, whilst integrating "sport pressures." The influence of these sport pressures on disordered eating, however, remains unclear. Although there is cross-sectional, and some longitudinal support for the individual pathways of the Petrie and Greenleaf (2007) model in athletes (Stoyel, Slee, et al., 2020), the model as a whole had poor fit through cross-sectional structural equation modeling in female collegiate (NCAA D1) gymnasts and swimmers/divers (Anderson et al., 2011), adolescent Brazilian male athletes (various sports)—with 72% elite (de Sousa Fortes et al., 2015), and UK adult male and female athletes (various sports)—with 17.5% elite (Stoyel, Shanmuganathan-Felton, et al., 2020). Rather than "sport pressures," sociocultural pressures, body dissatisfaction, and internalization of appearance ideals were associated with greater disordered eating (de Sousa Fortes et al., 2015; Stoyel, Shanmuganathan-Felton, et al., 2020; Stoyel, Stride, et al., 2021). These findings seemingly imply that sport pressures have limited relevance for disordered eating in athletes of mixed competitive levels.

However, these studies operationalized sport pressures as a general objective construct, such as years in sport, number of hours training per week, etc. In contrast, Anderson et al.'s (2011) re-specification of the model in NCAA D1 female gymnasts and swimmers/divers found that the operationalization of *subjective* pressures experienced within the sporting environment (e.g., from coaches, teammates, spectators, and peers) to appear thin and lose weight *was* associated with greater dietary restraint, as well as bulimic symptoms mediated by body dissatisfaction and dietary restraint. This is consistent with longitudinal evidence that greater perceived sporting pressures to lose weight predicted lower body satisfaction (Anderson et al., 2012) and greater disordered eating (Chatterton et al., 2017; Krentz & Warschburger, 2013) in elite male and female athletes. Several other aspects of "sporting pressures" have also been proposed, including weight cycling and dieting, the early start of sport-specific training, traumatic events including injuries, coaching behaviors, rules and regulations in sports (e.g., weight classes), and participating in sports that promote a lean body ideal (Bratland-Sanda & Sundgot-Borgen, 2013). Clarification of which specific aspects of an athlete's experience may predispose, precipitate, or maintain disordered eating would inform the refinement of appropriate and targeted interventions.

Qualitative research can play a critical role in identifying these aspects and clarifying these fluid and developing constructs (Brannen, 2017). Congruent with the longitudinal studies above, several qualitative studies have identified key themes of pressure from coaches and peers to lose weight (Stirling & Kerr, 2012). However, other key themes have also been identified, including beliefs about weight loss being linked with performance (Coppola et al., 2014), revealing uniforms (Steinfeldt et al., 2013), and difficulty balancing athletic and non-athletic identities (Stoyel, Delderfield, et al., 2021). The existing qualitative research offers rich information regarding the highly individualized experiences of disordered eating among elite athletes but requires consolidation and synthesis to clarify dominant themes.

Of similar importance is the investigation of barriers and facilitators for help-seeking in this population. Help-seeking for disordered eating is rare in the general population (Fatt et al., 2019; Hart et al., 2011; Mond et al., 2007), with few studies investigating elite athletes. Martin and Anderson (2019) found that only 1.5% of elite collegiate athletes had sought help for disordered eating, despite 7.4% reporting a past or present clinically diagnosed eating disorder and 27.7% scoring in the 90th percentile for disordered eating on the Eating Disorder Examination—Questionnaire. Martin and Anderson (2019) further found that perceived stigma was a barrier, mediating the relationship between disordered eating and help-seeking in elite collegiate athletes. Other findings to date have primarily been qualitative and identified themes of limited education on the topic for athletes (Thorpe et al., 2021), normalization of disordered eating by coaches and peers (de Bruin & Oudejans, 2018), and fear of losing perceived performance benefits from disordered eating (Willson & Kerr, 2022). Notably, whilst these factors may impact on help-seeking, they may also be relevant risk factors for disordered eating. For example, inadequate education and normalization of disordered eating in the sport environment, beliefs about impact of weight loss on performance, and shame and stigma could each be relevant for the development and maintenance of disordered eating cognitions and behaviors. Thus, the interpretation of the several existing qualitative studies should consider how specific sport pressures may contribute to both the risk factors for disordered eating in elite athletes and the barriers/facilitators for help-seeking.

The synthesis of these disparate strands of information would allow for the identification of meta-themes, which could translate into more precise research questions, policy-making, and intervention development (Walsh & Downe, 2005). Such a meta-synthesis of qualitative research in this area has not been conducted to date. Thus, this review aimed to provide a systematic review and meta-synthesis of qualitative findings into (1) the risk factors (including predisposing, precipitating, and maintaining) of disordered eating in elite athletes and (2) barriers and facilitators of help-seeking.

2 | METHODS

The study was prospectively registered with PROSPERO (CRD42022336578) and has been reported according to PRISMA (Page et al., 2021) and ENTREQ guidelines (Tong et al., 2012) (https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=336578).

The inclusion criteria were: (1) peer-reviewed articles in English; (2) including current or former elite athlete participants (national, international, professional, and NCAA D1); (3) qualitative study design, with athletes sharing their experiences with disordered eating in their sporting environment. Exclusion criteria for the review were articles only focusing on dancers, bodybuilders, coaching or support staff, or having mixed level of competition. The search was limited to only peer-reviewed articles and because we believed conceptual saturation to be reached based on those articles, we opted not to conduct further searches of "gray" literature (Thomas & Harden, 2008). Searches were conducted using four electronic databases including CINAHL (EBSCO), PsychINFO (OVID), MEDLINE (OVID), and Scopus, following consultation with a health librarian. All years were included up until the search date, July 1, 2022, with a follow-up search conducted on December 6, 2023. A search strategy was used following the Population Concept Context (PCC) method (Peters et al., 2020), including both index terms and searches of the title and abstract for key terms (see Supplement S1 for the full search strategy). Population included searches relating to "athlete." Concept included searches relating to "disordered eating." Context included searches relating to "qualitative research." Searches were then limited to peer-reviewed articles.

As per our pre-registration, we conducted our initial search limited to only English articles; however, to promote diversity we opted to conduct an additional search including non-English articles. The English-only search yielded 828 hits (686 at the initial search and an additional 142 at the follow-up), which were exported to EndNote software, then imported into Covidence software ($n = 343$ duplicates removed automatically). Title and abstract were screened independently by two reviewers (SJF, SD) via Covidence, leaving 87 studies. Full-text screening was conducted by SJF screening, with SD separately screening a random selection of 20% of the included articles. Any discrepancies were resolved through discussion between the two reviewers and DM. A further search across the databases on February 14, 2024 limited to *non-English* articles produced an additional 44 articles ($n = 36$ after duplicate removal). Thirty-three articles were excluded based on title and abstract, with three articles unable to be assessed or analyzed due to language barriers (see Supplement S2 for a list of non-English articles). See Figure 1 for the PRISMA flowchart.

2.1 | Data extraction

The remaining articles ($n = 34$ at the initial search, $n = 4$ at the follow-up search) were included for data extraction. SJF initially extracted the data and SD checked the extracted data with the original article. Discrepancies were discussed between the two reviewers and DM. Extracted data included: (1) author; (2) year of publication; (3) participant demographics (e.g., age, gender, type of sport, former vs. current athlete, level of competition); (4) sample size; (5) aims of the research; (6) type of qualitative method (e.g., study design and theoretical framework); (7) analysis used; and (8) results (the text under "results," "findings," or "conclusions" and including relevant tables). Data were extracted into a Microsoft Excel sheet, with the results sections saved as a text file.

2.2 | Study risk of bias assessment

Each included article was assessed for risk of bias by two reviewers, using the checklist for appraising qualitative research (CASP; https://casp-uk.net/wp-content/uploads/2018/03/CASP-Qualitative-Checklist-2018_fillable_form.pdf), a 10-point guide commonly used to assess the design and reporting of qualitative research, including aims, qualitative methodology, research design, recruitment strategy, data collection, reflexivity, ethics, data analysis, statement of findings, and research impact. These factors can vary across qualitative methodologies according to an author's epistemological stance (e.g., should data saturation be assessed or not), and thus assessments were made primarily based on how authors reported *consideration* of each factor rather than applying static rules across methodologies. SJF completed the appraisal using the CASP and SD checked their appraisal against the CASP. Disagreements (1.3%) were discussed between the two reviewers, with DM consulted where agreements could not be made. Given that all results provided rich data sources, no articles were excluded from analysis based on quality assessment.

2.3 | Meta-synthesis

Data from the included studies were analyzed using a thematic synthesis method, with an inductive approach with line-by-line coding rather than using the themes identified in the articles (Thomas & Harden, 2008). The initial 34 articles were first read by SJF. Four articles were then selected to be read and coded independently by SJF, DM, EG, and NJ using NVivo 20, who then met to compare codes and created an initial codebook. A fifth article was then coded independently by the same authors using the initial codebook, followed by another meeting to discuss any changes to the codebook. Two more articles were coded by SJF using this updated codebook, followed by another meeting with the same authors to discuss the coding approach. SJF then coded the remaining articles, followed by a final review with DM, EG, NJ, and PH of the codebook and discussion of the initial organization of these codes into descriptive themes. In thematic synthesis, meta-themes are developed by using the descriptive themes to answer the review question (Thomas & Harden, 2008). Accordingly, SJF reviewed the descriptive themes and drew out meta-themes that represented risk/protective factors for disordered eating and barriers/facilitators for help-seeking. These meta-themes were then reviewed and refined by the broader research team. The additional four articles (Kovács et al., 2022; Langan-Evans et al., 2022;

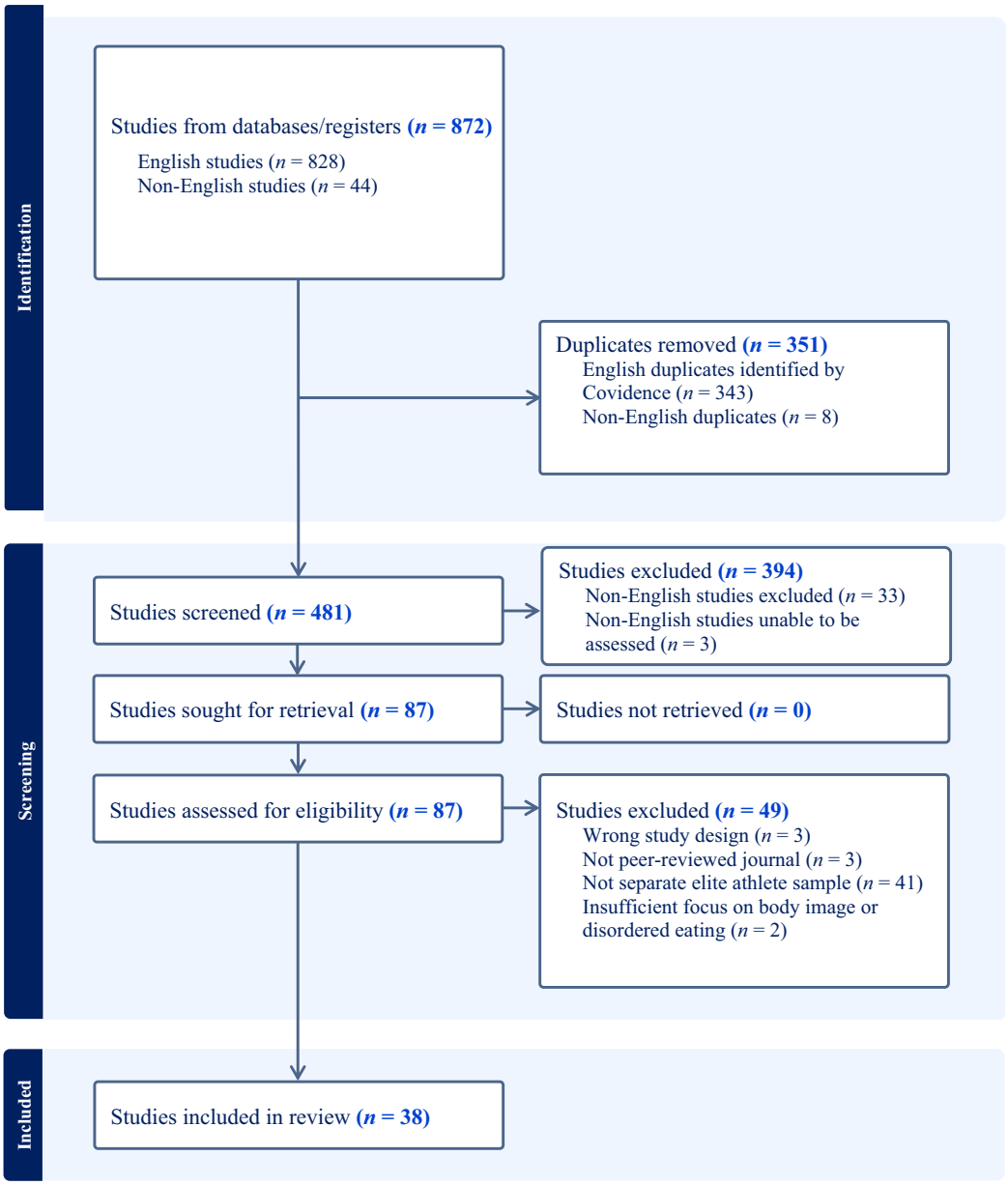

FIGURE 1 PRISMA flowchart of article identification and screening.

McHaffie et al., 2022; Rueda Flores et al., 2023) included in the updated search underwent coding after the initial meta-synthesis and so were coded deductively against these pre-existing meta-themes. There was good alignment, with no additional new descriptive themes identified, suggesting that thematic saturation had been met.

2.4 | Reflexivity

We used an inductive approach for the coding and development of meta-themes with the intent to remain theoretically neutral; however, recognition must be made regarding how the position, knowledge basis, and experience of each author may have biased these interpretations. SJF (male), DM (female), and SD (female), are clinical psychologists and researchers, specialized in eating disorders, but with limited experience in elite sports. PH (female) is an academic psychiatrist who has researched and cared for people with extreme levels of exercise in the context of an eating disorder, some of whom were elite athletes. NJ (female) is an accredited practicing dietitian and sports dietitian working with elite athletes. EG (female) is a researcher focusing on improving physical activity and health promotion, with limited experience with eating disorders or elite sporting environments. As lead author and initially responsible for identifying the meta-themes, SJF was influenced by his understanding of established theories of eating disorders and behavioral change, and the general literature on disordered eating in elite athletes. For example, SJF's clinical-researcher training and experiences primed him to identify "over-valuation" (as per Fairburn et al., 2003) and "appearance-ideal internalization" (as per Stice, 2001) as themes for disordered eating, and aspects of

the Health Belief Model (Janz & Becker, 1984) as themes for help-seeking. These biases were discussed among the research team, with valuable input from EG (non-clinician) and NJ (extensive dietetic experience working in an elite athlete setting) to consider alternate interpretations of the codes (e.g., athletes experiencing multiple appearance "ideals", athletes engaging in disordered eating behaviors unrelated to body image concerns). Through these reflective discussions, we attempted to challenge pre-existing assumptions in coding and meta-theme development. However, given that thematic synthesis aims to inform policy and practice (Thomas & Harden, 2008), the meta-themes, once established, were compared with existing research and theory to develop testable hypotheses—as addressed in Section 4.

3 | RESULTS

The 38 included articles were published between 2003 and 2023. See Table 1 for the data extracted. Most studies were conducted in the United States ($n = 12$, 31.6%), followed by the UK ($n = 11$, 28.9%), Canada ($n = 4$, 10.5%), New Zealand ($n = 3$, 7.9%), Spain ($n = 2$, 5.3%), and one study each in the Netherlands, Portugal, Hungary, Brazil, Denmark, and France. Studies rarely differentiated sex and gender, and generally referred to "males" or "females." Of the 37 such studies, 12 (32.4%) included males and 33 (89.2%) included females. Most included athletes up to the international level ($n = 25$, 65.8%), with 11 including top level college athletes (28.9%), and 2 including athletes at the national level (5.3%). Only one study included para-athletes (Alexander et al., 2020). Athletes were 12–53 years old ($M = 22.6$, $SD = 4.8$).

3.1 | Quality assessment and risk of bias

Quality assessment using the CASP (see Supplement S3) indicated that most studies addressed at least 8/10 of the criteria well ($n = 27$, 71.1%). Most studies did not report appropriate consideration of the relationships between researcher and participant. Further, few studies discussed data saturation or how researchers responded to issues that arose during the data collection.

3.2 | Meta-synthesis

Based on the thematic coding of the data extracted from the 38 studies, eight meta-themes were identified, alongside seven subthemes (see Figure 2 for a thematic map relating to disordered eating). In the description of each meta-theme/subtheme below, italicized data extracts indicate direct quotes from athlete participants and non-italicized data extracts indicate interpretations from authors within their "results" section, with additional data extracts included in the tables following each meta-theme. These data were chosen to best represent the meta-themes, based on discussion within our research team.

3.2.1 | Meta-theme: The coach–athlete power imbalance—"*coaches have the ability to shape your future*"

Power imbalances between athletes and their coaches were considered influential on the development of disordered eating and help-seeking (see Table 2). Coaches were seen to have power over athletes, and as such, "control was relinquished to coaches" (Pereira Vargas & Winter, 2021). Although some athletes recognized "positive strategies to communicate about body image and health choices" (Beckner & Record, 2016) from coaches, most experienced pressures for disordered eating and body image concerns.

Athletes discussed several reasons for this power imbalance. For some, trust was developed over time with the intimate bonds forming between athlete and coach: "*he knows me better than my parents*" (Roessler & Muller, 2018, female), leading athletes to "place their trust in the coach and their assessment of the best manner in which to participate in the sport" (Bloodworth et al., 2017). Other participants attributed these imbalances to athletes' need for validation, whilst others said that coaches held significant sway over athletes' training and competitive opportunities, acting as perceived barriers for change or help-seeking. Accordingly, several athletes reported fear-based power imbalances. These power imbalances, whether based on trust, approval-seeking, or fear, exposed athletes to pressures for body image concerns.

Subtheme: Power and abusive relationships

Abuse of these power imbalances was seen as particularly harmful for disordered eating and help-seeking. Some coaches used their position of power to enforce disordered eating through abusive comments and behaviors: "*I remember my coach just came up from behind me, grabbed my dessert out of my hand and pretty much threw it on the empty dirty dishes tray… later that evening we had a team meeting and she specifically called out me and one other person who didn't meet our competition goal weight*" (Willson & Kerr, 2022, female). The feelings of fear and shame associated with this abuse impacted on disordered eating, performance, and undermined athlete's self-efficacy to seek-help.

Subtheme: At-risk populations: Age, gender, and para-athletes

These power imbalances were greater for certain vulnerable groups of athletes. Many athletes began their athletic careers at a very young age when they were more vulnerable to influences, allowing norms to go unchallenged for years. Coaches also sometimes treated certain demographic groups differently from others, with females experiencing greater power imbalances than males. These differences often led to relationships based on fear rather than mutual respect: "*sometimes, the girls are afraid of coaches (…) we respect them… the girls mind what the coaches say a lot more*" (Francisco et al., 2012, male). Finally, this power imbalance was magnified for para-athletes due to condescending comments and attitudes from coaching staff. These imbalances impacted how athletes felt about themselves and their bodies, whilst also acting as a barrier for help-seeking.

TABLE 1 Data extracted from each included article.

Author (year)	*N* elite athletes	Country (race)	*N* male/female	Age range (*mean*)	SES	Sport type	Current/former	Level	Design	Qualitative analysis
Alexander et al. (2020)	8	Canada (NR)	0/8	NR	NR	Mixed para-athletes	Mixed	International	SSI	TA (Braun & Clarke, 2013)
Beckner and Record (2016)	28	United States (78.6% White; 10.7% Black; 3.6% Asian-American; 3.6% Filipino/White; 3.6% Middle Eastern/White)	0/28	18 to 23 (19.4)	NR	Mixed	Current	D1 college	SSI	Open coding and axial coding
Bloodworth et al. (2017)	34	UK (NR)	16/18	12–21 (17.4)	NR	Gymnastics	Current	National and international	SSI	Unclear
Busanich et al. (2014)	2	United States (100% White)	1/1	19–34 (26.5)	NR	Endurance—running	Mixed	D1 college	SSI	Narrative enquiry and case-study
Carson et al. (2021)	29	United States (NR)	0/29	18–36 (24.6)	NR	Endurance—running	Mixed	D1 college	SSI	TA (Braun & Clarke, 2006)
Coppola et al. (2014)	8	United States (62.5% White; 25% Asian-American; 12.5% African American)	0/8	NR (19.3)	NR	Mixed	Current	D1 college	SSI	IPA
Darko (2009)	10	UK (70% White; 30% African-Caribbean)	10/0	18–25 (NR)	NR	Rugby	Current	Top university	SSIs	Miles and Huberman (1984)
de Bruin and Oudejans (2018)	8	The Netherlands (NR)	0/8	18–33 (NR)	NR	Mixed —esthetic, weight-class, endurance	Mixed	National and international	SSI	Phenomenological analysis
Francisco et al. (2012)	9	Portugal (NR)	NR	NR (15.1)	NR	Gymnastics	Current	National and international	Semi-structured focus groups	Inductive-deductive content analysis
Gordon et al. (2021)	12	UK (NR)	5/7	20–28 (NR)	NR	Judo	Mixed	National and international	SSI	Inductive TA
Kovács et al. (2022)	4	Hungary (NR)	0/4	NR (20.3)	NR	Rhythmic gymnastics	Former	International	SSI	TA (Braun & Clarke, 2006)
Krane et al. (2004)	21	United States (100% White)	0/21	NR (20.5)	NR	Mixed	Current	D1 college	Semi-structured focus groups	Open and axial coding
Kroshus et al. (2014)	35	United States (NR)	0/35	18–22 (19.8)	NR	Endurance—running	Current	D1 college	SSI	Bronfenbrenner's ecological model
Langan-Evans et al. (2022)	7	UK (NR)	0/7	NR (28.7)	NR	Mixed	Current	International	SSI	Reflexive TA (Braun & Clarke, 2019)

(Continues)

TABLE 1 (Continued)

Author (year)	*N* elite athletes	Country (race)	*N* male/female	Age range (*mean*)	SES	Sport type	Current/former	Level	Design	Qualitative analysis
Martinez-Pascual et al. (2016)	8	Spain (NR)	0/8	NR (37.5)	NR	Mixed	Mixed	National and international	Unstructured interview and SSI	Phenomenological analysis—Giorgi analysis
McHaffie et al. (2022)	12	UK (NR)	0/12	NR	NR	Soccer	Current	Professional	SSI	Open coding and TA
Morgan et al. (2020)	15	United States (NR)	9/6	NR	NR	Mixed	Mixed	D1 college	SSI	Grounded theory coding
Nemeth et al. (2020)	36	United States (NR)	0/36	18–22 (NR)	NR	Mixed	Current	D1 college	SSI	NR
Papathomas and Lavallee (2010)	4	UK (100% White)	0/4	18–24 (21.0)	NR	Mixed	Mixed	National and international	SSI	IPA
Papathomas and Lavallee (2012)	1	UK (NR)	0/1	24 (24.0)	NR	Tennis	Former	National	Narrative interviewing	Narrative enquiry and case-study
Papathomas and Lavallee (2014)	1	UK (NR)	0/1	20 (20.0)	NR	Basketball and netball	Current	National	Narrative interviewing	Narrative analysis
Pereira Vargas and Winter (2021)	17	UK (NR)	0/17	NR (22.8)	NR	Powerlifting	Current	National and international	SSI	TA (Braun & Clarke, 2006)
Pinto et al. (2020)	17	Brazil (NR)	17/0	18–27 (22.5)	NR	Artistic gymnastics	Current	National and international	Mixed-methods: survey and focus groups	Classical and exploratory content analysis
Roessler and Muller (2018)	10	Denmark (NR)	0/10	18–53 (26.8)	(NR)	Track and field	Current	National and international	SSI	Descriptive and explorative method
Rueda Flores et al. (2023)	22	Spanish (NR)	0/22	16–26 (20.8)	(NR)	Wrestling	Current	International	SSI	TA (Braun & Clarke, 2006)
Schofield et al. (2022)	8	New Zealand (100% European)	0/8	18–30 (NR)	(NR)	Endurance cycling	Current	International	SSI	TA (Braun & Clarke, 2006)
Steinfeldt et al. (2013)	9	United States (66.6% White, 22.2% Black, 11.1% Biracial)	0/9	NR (19.8)	(NR)	Volleyball	Current	D1 college	SSI	Consensual qualitative research
Stephan and Bilard (2003)	16	France (NR)	8/8	NR (30.6)	(NR)	Mixed	Former	International	Mixed-methods: survey and SSI	Thematic content analysis
Stephens et al. (2021)	15	United States (NR)	4/11	18–23 (NR)	(NR)	Mixed	Current	D1 college	Mixed-methods: survey and SSI	TA (Thomas, 2003)

TABLE 1 (Continued)

Author (year)	*N* elite athletes	Country (race)	*N* male/ female	Age range (*mean*)	SES	Sport type	Current/ former	Level	Design	Qualitative analysis
Stirling et al. (2012)	8	Canada (NR)	0/8	18–24 (19.9)	(NR)	Rhythmic gymnastics	Former	International	SSI	Creswell (1998) meaning units
Stoyel, Stride, et al. (2021), Stoyel, Delderfield, et al., 2021	9	UK (NR)	4/5	19–44 (26.9)	(NR)	Mixed	Current	National and international	SSI	Deductive TA
Tamminen et al. (2013)	5	Canada (NR)	0/5	18–23 (NR)	(NR)	Mixed	Current	International	SSI	IPA
Thorpe and Clark (2020)	12	New Zealand (100% Caucasian)	0/12	30–38 (NR)	(NR)	Endurance	Current	National and international	SSI	TA (Braun & Clarke, 2006)
Thorpe et al. (2021)	30	New Zealand (NR)	0/30	NR	(NR)	Endurance and rugby	Current	National and international	SSI	TA (Braun & Clarke, 2006)
Voelker and Reel (2018)	13	United States (69% Caucasian, 7.7% Asian American/Pacific Islander, 7.7% Caucasian and Asian American/Pacific Islander, 7.7% Caucasian and Asian American/Pacific Islander and Native American, 7.7% Hispanic/Latino/Mexican American)	13/0	16–24 (18.5)	(NR)	Figure skating	Current	National and international	SSI	Inductive TA (Braun & Clarke, 2006)
Voelker and Reel (2019)	13	United States (69% Caucasian, 7.7% Asian American/Pacific Islander, 7.7% Caucasian and Asian American/Pacific Islander, 7.7% Caucasian and Asian American/Pacific Islander and Native American, 7.7% Hispanic/Latino/Mexican American)	13/0	16–24 (18.5)	(NR)	Figure skating	Current	National and international	SSI	Inductive TA (Braun & Clarke, 2006)
Williams (2012)	11	UK (NR)	6/5	NR	(NR)	Mixed	Current	National and international	SSI	Unclear
Willson and Kerr (2022)	8	Canada (NR)	0/8	24–29 (NR)	(NR)	Mixed—esthetic	Former	National and international	SSI	TA and reflexive TA (Braun & Clarke, 2019)
Total	**470**		**106 (22.4%) 367 (77.6%)**	**12–53 (22.5)**						

Abbreviations: IPA, interpretive phenomenological analysis; NR, not reported; SES, socio-economic status; SSI, semi-structured interview; TA, thematic analysis.

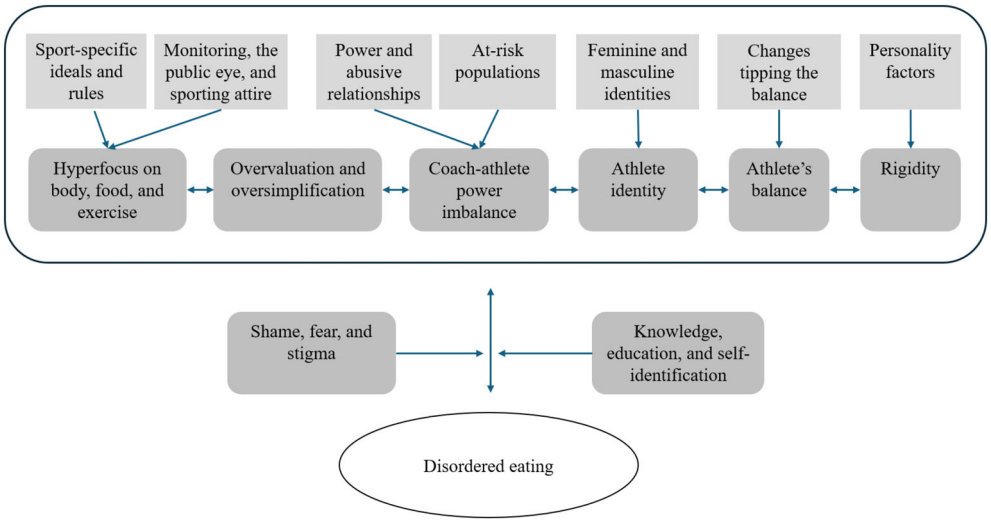

FIGURE 2 Thematic map of the relationships between the meta-themes, subthemes, and disordered eating. Rectangles represent sub-themes and rectangles with rounded edges represent meta-themes.

TABLE 2 Data extracts for meta-theme: the coach-athlete power imbalance.

"*They're literally God to their athlete, like they listen to every word they say*"	Pereira Vargas and Winter (2021), female
"*I didn't start blaming my weight until my coaches did*"	Carson et al. (2021), female
"*My first trainer (…) has known me since I was five years old, he knows exactly, how I am thinking, and he knows how to treat me, I trusted him, and I trained maybe seven times a week for 1.5 hours*"	Roessler and Muller (2018), female
"*I can lose and gain weight when I want, that's something I can do… And I got determined to make the coaches happy. I felt like that my purpose was to make them happy*"	Willson and Kerr (2022), female
"*The [coach] did basically imply to someone that, that she would not be [participating] if she didn't lose weight*"	Coppola et al. (2014), female
Subtheme: power and abusive relationships	
"*We were told that we were not allowed to eat bread or carbs or anything. Not even fruit and of course no junk was allowed ever*"	Stirling et al. (2012), female
"*Well, when I came back to the training, everyone made chubby cheeks, and pinched my cheeks, and then the trainer said to me in front of the group: Yee, you look like Miss Piggy*"	de Bruin and Oudejans (2018), female
"*[My coach] was telling me at the time how I was not good, too fat. I wasn't correcting my mistakes fast enough and I just couldn't. I was paralyzed in [training] trying to do my best but clearly it was worse*"	Willson and Kerr (2022), female
"*It was a very disappointing remark of my coach's that when I told her [about my bulimia],1 she said 'look at the other girl, she chose the right one,' because she was anorexic then. So she is at least lean*"	Kovács et al. (2022), female
Subtheme: at-risk populations: age, gender, and para-athletes	
"*I think because when you're little you don't know obviously whether something is dangerous until you do it. So if the coach has told you to do something and you do it and you realize you're safe and you build up that trust with the coach. That the coach wouldn't ask you to do something if it was dangerous and then obviously as you get older you just continue with that*"	Bloodworth et al. (2017), gender unclear
"*The girls are [weighed] once a week and the guys are [weighed] every three weeks*"	Voelker and Reel (2019), male
"*Coaches have the ability to shape your future […] I can't believe a coach had that kind of power over me… and still does*"	Alexander et al. (2020), female
"*A lot of athletes with disabilities feel that the coaches treat us like children*"	Alexander et al. (2020), female

3.2.2 | Meta-theme: The hyperfocus on body, food, and exercise—"*light rowers only talk about weight and food*"

The psychosocial "high-risk culture that overemphasized body and nutrition" (de Bruin & Oudejans, 2018) in elite sport was seen to impact disordered eating and help-seeking (see Table 3). Body composition, diet, weight, and exercise were constant topics of conversation within these environments: "*light rowers only talk about weight and food*" (de Bruin & Oudejans, 2018, female). This hyperfocus could lead to the normalization of disordered behaviors and body-focused comments directed at self and others, undermining the perceived severity

TABLE 3 Data extracts for meta-theme: the hyperfocus on body, food, and exercise.

"*If your teammates are saying that they're doing this, they're eating this, or eating that, then you might feel pressure to do that as well*"	Stoyel, Delderfield, et al. (2021), female
"*My coach made us clap for my teammate who had hit her goal weight, but I just remember looking at [my teammate] and thinking about how skinny she was, her ribs were literally sticking out of her skin. It was hard to praise someone who looked so sick, and I know she wasn't eating properly, but that's what [my coach] wanted us to look like*"	Willson and Kerr (2022), female
"*I think that at the time, rather than helping, they made it worse. Because they were the ones who put the idea of weight in my head and made it seem like it was normal, so I preferred not to keep telling them about it*"	Rueda Flores et al. (2023), female
Subtheme: sport-specific ideals and rules	
"*My normal weight is 60 to 62 kilos and having to lose weight to 48, and then to 52 and then to 57 kilos, is not normal. You go till the edge every time… That is why I terminated my career, I couldn't do it anymore, I was entirely broken. Mentally, physically*"	de Bruin and Oudejans (2018), female
"*The tops are encouraged to be as thin as they can because you go higher, and because you go higher you get more marks and stuff like that. So I think they think, like, it's their job, like their part of the trip, their part of whatever they're in to be thin*"	Bloodworth et al. (2017), female
"*I think every weight making athlete has body dysmorphia from needing to make weight and the struggles that brings with it. I think you're never truly happy with how you look and your body composition until you stand on the scales and then you only look like that for about 10 minutes anyway*"	Langan-Evans et al. (2022), female
Subtheme: monitoring, the public eye, and sporting attire	
"*It's kind of scary going into like the BodPod and getting weighed all the time. I never thought it was like that important until I got [on the National Team] and was under those coaches' eyes. I felt like everyone was looking at your weight no matter which weight you were. So, I thought that was really hard, just mentally*"	Willson and Kerr (2022), female
"*It was when [the higher level] came that there started being more media, and I really took it upon myself to lose the weight and really focus on my body image… That's a lot of eyes on a single person*"	Voelker and Reel (2018), male
"*I wasn't thinking as much about the game as I should have been. I was thinking about, you know, what I looked like and what people were thinking about me instead of focusing on what I need to be doing for the game, or what I should be mentally preparing for the game. I would be worried, pulling my spandex down so I wasn't falling out of them. Or pulling my jersey down so people wouldn't see my stomach or my hips*"	Steinfeldt et al. (2013), female
"*So, knowing that you're getting your weight checked every 8 weeks, knowing that you were in the red zone, amber, green, it was almost, like, 'well if I'm in red now, how am I going to get into green? The only way to get into green is not eating, eating minimal', like, I think that is the main thing why women players struggle is because we constantly get weight checked and skinfolds*"	McHaffie et al. (2022), female

or susceptibility of adverse outcomes: "*I didn't know, I didn't even ask myself because I thought it was normal*" (Rueda Flores et al., 2023, female). Reinforcement of these norms through validation from coaches or competitive success strengthened these attitudes. Thus, many athletes attributed disordered eating directly to their sporting environments: "*I never had a bad relationship with food before [powerlifting]*" (Pereira Vargas & Winter, 2021, female).

Subtheme: Sport-specific ideals and rules

Certain sport-specific rules and body ideals appeared to intensify these pressures, including esthetic, anti-gravitational, weight-class, and endurance sports. In esthetic sports (e.g., figure skating, gymnastics, and diving), athletes' performances are judged based on appearance, with "*achieving a specific look… sometimes seen as more important than technical skill*" (Voelker & Reel, 2019, male). For these athletes, "*the body is very important*" (Martinez-Pascual et al., 2016, female) and they reported pressures to achieve "*a lean look*" (Voelker & Reel, 2018, male). Other sports (e.g., combat sports, rowing, and powerlifting) enforced certain limitations regarding weight. These athletes engaged in "severe and extreme methods of weight loss" (Gordon et al., 2021) for the perceived competitive advantage of fitting a weight-class below their usual weight. Some of these athletes believed that their "*eating disorder had nothing to do with body image*" (de Bruin & Oudejans, 2018, female) rather because of having to make weight, whilst others viewed their eating disorder as "*far beyond*" (de Bruin & Oudejans, 2018, female) the weight categories. Sports which involved challenging gravity (e.g., gymnastics and rock climbing) were also considered high-risk for disordered eating. Athletes who were thrown by partners were generally judged based on weight "*regardless of their skill level*" (Voelker & Reel, 2019, male). Finally, athletes from endurance sports often reported idealized images of "*what people think an elite runner should be*" (Thorpe et al., 2021, female), wherein "lean and toned bodies are equated with fast, efficient, and athletically successful

bodies" (Thorpe & Clark, 2020). Thus, athletes suggested that pressures from the sporting environment are exacerbated by sport-specific rules and body ideals.

Subtheme: Monitoring, the public eye, and sporting attire

This focus on body, eating, and exercise was often magnified by what felt like constant surveillance through body monitoring procedures, the public eye, and exposing uniforms. Body monitoring procedures (e.g., weighing, calorie counting, body composition scans, and skinfold tests) were commonly reported as "*invasive and uncomfortable*" (Schofield et al., 2022, female), amplifying the atmosphere of pressure associated with body and weight: "*there's definitely been people in the squad now and previously who have become obsessed with skinfolds and tried really drastic things to reduce them*" (Schofield et al., 2022, female), "*nothing is more humiliating than when four others are looking at your weight*" (Kovács et al., 2022, female). Athletes also reported feeling exposed to the critique of audiences both in-person and via the media, which impacted on body image concerns. This feeling of exposure was often exacerbated by revealing sporting attire: "*Sport attire is so revealing. It was a drama for me; I didn't sleep the night before competition. It only made me more insecure. […] It was hell for me… you need to run 400 meters, along the entire audience and everyone can see you*" (de Bruin & Oudejans, 2018, female). This anxiety associated with feeling constantly exposed and monitored could distract from focus and performance.

3.2.3 | Meta-theme: Rigidity—"*only one ideal*"

Rigidity in body ideals, eating and exercise behaviors were considered risk factors for disordered eating (see Table 4). Several athletes discussed pressure to fit "*only one ideal*" (Voelker & Reel, 2019, male) body weight and shape, regardless of individual differences. Endorsement of these rigid ideals by coaches and training staff led to internalization and normalization. Reinforcement also came through comparisons with "successful" athletes, which strengthened beliefs about the perceived benefits of dietary restriction rather than potential risks. Accordingly, attempts to fit the mold by "copying training and dietary behaviors" (Stoyel, Delderfield, et al., 2021) contributed to rigid eating and exercise behaviors. Contrastingly, sporting environments that promoted individualization regarding flexible body ideals and training regimens were seen as protective against disordered eating. Some athletes suggested that breaking the mold of the ideal body would protect against disordered eating, by "recognizing individual differences when developing training plans because all athletes' bodies are unique" (Coppola et al., 2014).

Subtheme: Personality factors

Although rigidity was often identified in athletes' external environments, they also acknowledged internal rigid personality traits. Many traits considered beneficial for athletic success (e.g., perfectionism and obsessionality) were also attributed as predisposing for disordered eating. Athletes simultaneously admired rigid behaviors, whilst also being wary of what was considered an "unhealthy fixation and obsession with their weight" (Gordon et al., 2021). Thus, although other personality factors (e.g., anxiety sensitivity and rejection sensitivity) were sporadically referenced, rigidity both within and external to an athlete was considered particularly predisposing for disordered eating among athletes.

3.2.4 | Meta-theme: The athlete's balance—"*you go to the edge every time*"

A major challenge identified by athletes was maintaining several delicate balances (see Table 5). Inherent to being an athlete was the push to optimize eating and exercise, often including "*pushing my body to*

TABLE 4 Data extracts for meta-theme: rigidity.

"*It was important for us to look all the same, which is super thin and tall. Which is hard for 6 girls to look the same. So, there's a few girls on my team that were naturally thin and I was not so I was getting in trouble for not being as thin as they were*"	Willson and Kerr (2022), female
"*I was advised to lose 5 kilos. I had to weigh 60 kilos […] and in the end, you want to weigh 60 kilos*"	de Bruin and Oudejans (2018), female
"*If someone is running really well at the time and she's eating very little, you think: she must be doing something right*"	Nemeth et al. (2020), female
"*Ppen the ideals to not just one body type, but what works best for the skater… The emphasis should be on function, not on appearance so much*"	Voelker and Reel (2018), male
Subtheme: personality factors	
"*Sport makes that I have to pay attention to food, that I need to plan […], but I think I might have gotten it anyway… because I possess certain characteristics [perfectionism and competitiveness] that I now know are risk factors for eating disorders*"	de Bruin and Oudejans (2018), female
"*I guess what precipitated me to do the things that I did eat healthier and stuff, eat super, super healthy, and work out twice as hard, and almost restrict (my)self… was I thought that's what elite level runners did*"	Busanich et al. (2014), male
"*I am a very self-demanding person, so just as I am demanding with wrestling with my studies with everything, I consider that I was also very demanding with my image*"	Rueda Flores et al. (2023), female

TABLE 5 Data extracts for meta-theme: the athlete's balance.

"*There's almost this obsession with becoming as light as possible but not to the point where your body is no longer able to perform at its maximum ability*"	Stoyel, Delderfield, et al. (2021), male
"*I'd say it's kind of like that Barbie look most times. The Barbie look doesn't really have too much going on most times in terms of muscles. It's all just very thin at the waist, you have the space in between your legs, and you don't have the arms going… maybe if you take out the chest, I'd say yeah… that's kind of the way I see female skaters, but obviously I see them as really strong underneath it. I don't think Barbie could do 10 push-ups*"	Voelker and Reel (2019), male
Subtheme: changes tipping the balance	
"*If my body can't run at this pace, then it's a failure, I'm a failure. I need to manipulate it. I need to train it. It needs to constantly be honed and tuned like a machine that I drive*"	Busanich et al. (2014), female
"*We were always taught to focus on our weight so it is always on my mind. So when I stopped gym I felt absolutely disgusting because I know I have gained weight*"	Stirling et al. (2012), female
"*You soon catch on that you are no longer considered an athlete*"	Stephan and Bilard (2003), female
"*For 14 years I was told that sweets, bread and that sort of stuff were taboo. Even when I was done competing I still feel bad about it. I called up a fellow retired gymnast once and asked, 'Can you eat bread yet, because I can't without feeling guilty'*"	Stirling et al. (2012), female
"*When I got out I thought I can eat whatever I want now because I am not under anyone's rules. I guess that is why I ballooned, I just ate everything*"	Stirling et al. (2012), female

what is considered extreme" (Voelker & Reel, 2019, male). Thus, although stereotypical "eating disorder" behaviors (i.e., extreme weight loss and vomiting) were typically considered unhelpful for health and performance, a general drive for leanness via subtle disordered eating behaviors was considered healthy and normal for success as an athlete, with low likelihood of severe adverse outcomes and therefore little reason to change. Faced with this arbitrary line between healthy and unhealthy disordered eating, athletes "*go till the edge every time*" (de Bruin & Oudejans, 2018, female).

This delicate balance also extended to appearance. Appearance-pressures within the sporting environment could be congruent with performance pressures, such as male rugby players who reported "fear of being perceived as over-weight, 'out of shape', less muscular and/or less adept than other rugby men" (Darko, 2009). Others experienced contradictory pressures, with pressure for a thin bodily appearance, whilst simultaneously performing with strength and endurance. This contrast was magnified when sociocultural pressures contradicted sport pressures, leading to an experience of body image duality: "*I like the way I feel when I get the muscle… but yet, in the back of my mind I get scared that I'm gonna get big and people are gonna look at me like 'oh my god.' … I get scared of looking too much like a guy, like having too much muscle.*" (Krane et al., 2004, female). Tensions between athletes' ideal body for performance and internalized sociocultural body ideals were seen to precipitate body image concerns and potentially disordered eating.

Subtheme: Changes tipping the balance

Various life changes could potentially tip these delicate balances, including injuries, drops in performance, coaching changes, shifts from in-season to off-season, pregnancy, puberty, body composition changes from training, up-coming competitions, and retirement. Such changes often led to comparisons with one's past self: "*when I get a [body fat] score that went up… you just think about it like for a like time afterwards and you're like 'Should I get back to where I was?'*" (Stephens et al., 2021, gender unclear). Feelings of failure to meet expectations were therefore often attributed to their bodies, precipitating or exacerbating disordered eating.

These changes were particularly common in retirement from sport, often leading to loss of identity, body composition changes, and loss of support. Disordered eating behaviors were common for retired athletes, either through the continuation of restrictive practices, or in compensation of these restrictive practices. However, other athletes reported reduced disordered eating following retirement due to finding a more holistic sense of identity and freedom from the sporting pressures: "*when I thought 'I simply quit,' it was such a relief. When I quit elite sport, my eating problem was over too*" (de Bruin & Oudejans, 2018, female). Overall, athletes' balances could often be tipped by various changes, but sometimes offered relief from the sporting pressures through retirement.

3.2.5 | Meta-theme: The athlete identity—"*it is who I am*"

With many athletes starting in sport during their formative years of childhood and adolescence, the formation of an athletic identity met several emotional needs including acceptance and belonging: "*I've been doing this [sport] my whole life; it is who I am*" (Morgan et al., 2020, female) (see Table 6). Although athletes often reported confidence associated with this "self-identity that is primarily defined by optimal athletic performance and success" (Busanich et al., 2014), challenges to this identity often left athletes' needs unmet. Athletes naturally turned their focus to their bodies when their athletic identity felt threatened, given that their body was often reinforced as a symbol for this identity. Beliefs that "their physical bodies communicated their success in this sport to the world" (Carson et al., 2021), and

TABLE 6 Data extracts for meta-theme: the athlete identity.

"*I was not very popular at school, so sport gave me an identity, a niche!*"	Roessler and Muller (2018), female
"*Well, you are very much seen as a gymnast, you do not have your own identity. 'Who am I, how do I truly think about things?' It was all very confusing to me. Food provided a solution for this opacity*"	de Bruin and Oudejans (2018), female
"*Real athletes don't go to McDonalds after practice. The real athletes eat their vegetables*"	Voelker and Reel (2018), male
"*I couldn't go to many parties because I had a gala and they just didn't understand… they don't really understand the commitment [to] swimming*"	Stoyel, Delderfield, et al. (2021), male
Subtheme: feminine and masculine identities	
"*I'll go out to dinner with [non-athlete friends] and I'll have like three big plates and they'll have like one little one, and I'll be done with everything and they're still eating*"	Krane et al. (2004), female
"*We have like broader shoulders, bigger arms, and we don't want all that! We want to be like other normal females and have normal arms and not big shoulders*"	Beckner and Record (2016), female
"*In gym, I avoided it [puberty] and I was really thin and I didn't have a chest and my period was really rare*"	Stirling et al. (2012), female
"*It's the fear; what will the other boys think of me. I don't want them to see me as weak and puny*"	Darko (2009), male

alignment with appearance ideals and behaviors solidified their status as a "real" athlete. Perceived alignment with these ideals could inspire confidence, but incongruence led to body dissatisfaction. Accordingly, the intertwining of "being an athlete" and "looking like an athlete" could precipitate disordered eating: "*I'd lost my identity because my whole identity was tennis and with that gone out of the window I had nothing. I guess my identity became being thin*" (Papathomas & Lavallee, 2012, female).

Other aspects of athletes' identities were also often eroded through their separation from non-athletes. Due to their intense training regimens, travel for competition, and differing priorities, athletes often reported feeling "*different than everybody else*" (Krane et al., 2004, female), leaving "little time for other activities (such as leisure time with friends and families)" (Pinto et al., 2020). Physically and mentally isolated from non-athlete society, athletes experienced "added pressure on sporting achievement and success, as social life then depends on sport commitment" (Stoyel, Delderfield, et al., 2021). Within this sporting echo chamber, beliefs about body image, eating, and exercise often went unchallenged, and fears of losing this athletic identity were a barrier for change or help-seeking.

Subtheme: Feminine and masculine identities

This athletic identity could be in conflict with other aspects of one's identity, leading to distress and body image concerns. Most notably, female athletes reported conflict with their gender identities, often highlighted through appearance. Athletic bodies were considered at odds with "*normal females*." This extended to athletic eating and exercise behaviors, also considered in conflict with feminine norms. Athletes sometimes resolved these tensions by diminishing their feminine identities: "*I think your gender almost kinda disappears in a way… When you're out there, I'm not a girl, I'm a machine*." (Krane et al., 2004, female). This approach was highlighted in attitudes toward menstruation as "an annoyance or a distraction" (Schofield et al., 2022) and sometimes even desires for a pre-pubescent state.

Whilst this conflict was more commonly referenced by females, some athletes also noted the impact of their masculine identities on their body image. For some males, the drive for muscularity was tied to their masculinity. For others, perceptions of disordered eating as a "female problem" undermined male athletes' self-identification and help-seeking: "*I don't want them to know this because this is going to kill me. This is going to kill my image with them. I mean, this is embarrassing*" (Busanich et al., 2014, male).

3.2.6 | Meta-theme: Overvaluation and oversimplification—"*if you're not performing […] you're not thin enough*"

Another risk factor for disordered eating identified by athletes was the oversimplification of complex concepts into a single construct—specifically, performance and appearance (see Table 7). Tied to their athletic identity, performance was often prioritized as the apex metric of one's value. However, performance itself was also oversimplified as a derivative of body shape and weight, leading to the prioritization of the appearance of performance: "*if you're not performing, you're not working hard enough, you're not thin enough*" (Beckner & Record, 2016, female), even at the expense of actual performance: "*I've seen it (under-fueling) first-hand affect people to a point where it's actually ruined their careers because they've been more obsessed with what they look like than their football*" (McHaffie et al., 2022, female). The use of overlearned mantras: "*lighter is faster*" (Carson et al., 2021, female) and reductionistic mathematic formulas reinforced this oversimplification. These appearance-based expectations took on a currency-like value when they were tied to practical opportunities or threats such as sponsorship opportunities or being removed from the team, prioritizing body composition metrics over technical skill or actual performance. These messages, combined with appearance-based comparisons with top-performing athletes, precipitated disordered eating to improve perceived performance.

Unsurprisingly, this drive for leanness for performance was a source of great ambivalence for athletes. Many did attribute increases in performance to weight loss, at least in the early stages, and

TABLE 7 Data extracts for meta-theme: overvaluation and oversimplification.

"*If you did a mathematical equation, if you have two people who have the same acceleration but one is lighter, then the one who is lighter will win… people talk about the math and think if I lost five pounds then I could run that much faster per lap*"	Stoyel, Delderfield, et al. (2021), male
"*We had to be at that weight on the scale on that day, and if it wasn't, if we were too heavy, it was like all those other aspects—the physical aspects, it didn't matter if you were flexible or if you worked hard, if you weren't the weight you were supposed to be, all of that didn't matter*"	Willson and Kerr (2022), female
"*[My teammate] just showed up one day and all of a sudden wasn't on the team and when she was asked why, she was told, in front of the whole team, that it was because she was too fat and did not, you know, try hard enough or something along those lines*"	Willson and Kerr (2022), female
"*I'd gone from being the chubbier girl at the start line where I was 60 kilos and I was standing up against girls who were 50 kilos to losing 'a lot of weight' and recording faster times*"	Thorpe et al. (2021), female
"*There's days where I'm still confused. Like I'm tempted to go back [to disordered eating]. Cause then I'll have some sense of control. But then it scares me, so I don't know… there's points where I'm just like wavering on an edge like questioning whether I should dive in or not*"	Tamminen et al. (2013), female
"*I don't think that something I can do on my own but where to go from here I just don't know…*"	Papathomas and Lavallee (2014), female
"*Whenever I eat something that's not traditionally healthy, I don't feel bad about it. It's another source of energy which can really fuel my sessions*"	Pereira Vargas and Winter (2021), female
"*I actually did have a brain and that I could use it and I started to do really well so… I think that I found something else that I was good at, so it hasn't upset me too much*"	Papathomas and Lavallee (2010), female

TABLE 8 Data extracts for meta-theme: shame, fear, and stigma.

"*I feel guilty every time I have something unhealthy […] even a couple of pieces of chocolate, a bite of chocolate, then I feel like 'oh I might not make it now'*"	Williams (2012), female
"*I know I've had concerns and other people have had concerns, but no one's willing to speak about them on the team. It's kind of taboo*"	Kroshus et al. (2014), female
"*You think you're gonna be judged so it stops so many girls coming out about issues with food*"	Pereira Vargas and Winter (2021), female
"*I just feel guilty about off-loading on to them… I feel I just don't want to worry them*"	Papathomas & Lavallee, 2010, female
"*I just couldn't tell anyone because I felt checked. I was always afraid that everything would reach him [the trainer]*"	de Bruin and Oudejans (2018), female
"*From my experience [male athlete's] like: it's just weight, why can't you just cut weight? Why are you finding it so hard? [Coach] still jokes about it and I know he doesn't see it as an issue at all and talks about my experience almost like it's a joke*"	Pereira Vargas and Winter (2021), female
"*One senior paraphrased the type of conversation she would have with a team member: Listen, we need you. We need you to be at your best so that this team can be at its best […] If you need help, if you need anything let us know because we want to make sure that you're strong and you're here for us. That you're banging these workouts with us. That you're not getting sick on us. We want you here. We have to work through this. I'll be here to do whatever you need*"	Kroshus et al. (2014), female

changing their disordered eating threatened their perceived performance, and subsequently their sense of value, control, and identity. However, some athletes also reported concerns about the long-term health and performance impacts, such as low energy availability impacting on illness and injury, and the mental health impacts on performance due to distraction and distress: "*I've had a lot of bone related injuries… Last year I was swimming and broke my hand… my husband said 'nobody breaks their hand swimming,' so it did make me wonder*" (Thorpe & Clark, 2020, female). Trapped in this ambivalence, many athletes struggled to seek help or make change.

In contrast, athletes perceived a holistic view of themselves and their performance as protective for both disordered eating and help-seeking. For some, this meant focusing on long-term performance and health rather than short-term changes to appearance, with reinforcement from training staff: "the coach has sought to focus on technique as opposed to diet, and to focus on preserving the career of young gymnasts, rather than focusing on quick (and potentially damaging) fixes" (Bloodworth et al., 2017). Others reported a broadening of one's identity and value beyond their performance as an athlete. By focusing less on only appearance and immediate results, athletes were paradoxically able to improve well-being and sustainable performance.

3.2.7 | Meta-theme: Shame, fear, and stigma—"*you just feel so separated from the rest of the world*"

Shame, stigma, and fear of reaching out were considered major barriers for help-seeking and maintaining factors for disordered eating (see Table 8). Body image, eating, and exercise were often associated with strong feelings of shame, fear, and guilt. Such feelings were attributed

to "a stigma to mental illness that contradicted their identities as athletes" (Papathomas & Lavallee, 2010), as well as body-shaming practices within the sporting environment. Shame typically led to "efforts to disguise their weight concerns and disordered eating behaviors… [which] led to feelings of isolation" (Papathomas & Lavallee, 2010): "*you just feel so separated from the rest of the world. I kinda felt like I couldn't really share with anyone*" (Tamminen et al., 2013, female).

This isolation was compounded by stigma. Although body-focused comments were normalized, body image concerns and disordered eating were generally considered taboo subjects for teammates and coaches. Athletes were unwilling or unable to speak about these issues for various reasons, including fears of being judged, fears of burdening others, and concerns about compromised confidentiality. Rather than addressing the issue directly, athletes and coaches made light of the topic through "surface conversations in passing or even in a joking manner" (Beckner & Record, 2016). This psychosocial environment undermined athletes' hope for change and self-efficacy to seek help.

Contrastingly, sporting environments that actively discussed body image concerns in a sensitive way and modeled behaviors that challenged disordered eating behaviors were seen as protective. This atmosphere was often set by coaching staff and senior athletes: "*no, it didn't come from me, it was the coach who addressed it*" (de Bruin & Oudejans, 2018, female). Athletes described a preference for focusing on improving performance through challenging disordered eating, but in a sensitive and private way. Thus, sporting environments were seen to be able to both reinforce and challenge stigma around disordered eating.

3.2.8 | Meta-theme: Knowledge, education, and self-identification—"*I've never asked, no one's asked me, I've never really heard of it*"

Athletes acknowledged the role of education and self-identification in disordered eating and help-seeking (insert Table 9). In addition to stigma and fear, low insight was considered a key barrier for help-seeking. Misattributions of disordered eating behaviors as "healthy" were frequently reported by athletes and reinforced by coaching staff: "*So I started probably the healthiest diet I've ever gone on that summer. I came back and (coach) was like, 'You look stunning again'*" (Busanich et al., 2014, female). Here, the athlete's "healthiest diet" was one that led to weight loss rather than actual markers of holistic health, reflective of low perceived susceptibility and severity of disordered eating. These misaligned beliefs could even be detected in the interpretations by some of the authors in the included studies. Thus, provided that their eating and exercise behaviors did not fit the stereotyped perceptions of an eating disorder (e.g., vomiting and being severely underweight), athletes saw them as "healthy" rather than problematic: "Six of the eight participants described engaging in food restricting behaviors, three athletes described the use of calorie counting, four athletes described the use of laxatives and diet pills, and seven participants engaged in excessive exercise in their retirement transition. None of the participants in this study reportedly suffered from a clinical eating disorder" (Stirling et al., 2012).

Athletes cited inadequate education as critical to this low self-identification. Generic, rather than specific advice was considered problematic, leaving athletes without understanding of the impacts of disordered eating: "Many participants stated that their coaches emphasized '*health choices and what you are putting in your body*' […], but their advice was often simply to 'eat healthy' with no further explanation of what that meant" (Beckner & Record, 2016). Mixed-methods studies which included quantitative data confirmed the limited knowledge of athletes regarding appropriate sports nutrition or the impacts of low energy availability. Athletes called for better education regarding what is most beneficial for health and sustainable performance, starting at a young age: "I think if we were educated younger, you'd probably get into the importance of nutrition earlier. I just think some teams aren't able to provide the money they need to put into nutrition to then support women in the right way" (Langan-Evans et al., 2022, female). Improving knowledge and insight into disordered eating was seen as a facilitator for preventing disordered eating and encouraging help-seeking.

4 | DISCUSSION

This review synthesized qualitative findings regarding elite athletes' experiences with disordered eating, including risk factors and barriers/facilitators for help-seeking. From the 38 included studies, eight meta-themes were identified through inductive thematic synthesis (Thomas & Harden, 2008): (1) coach–athlete power imbalance; (2) hyperfocus on body, food, and exercise; (3) rigidity; (4) athlete's

TABLE 9 Data extracts for meta-theme: knowledge, education, and self-identification.

"*There was nothing that would have made me admit it and I thought that everybody else was just being stupid and that I just wanted to be healthy*"	Papathomas and Lavallee (2012), female
"*No. I just think we don't know. I've never asked, no one's asked me, I've never really heard of it*"	Thorpe et al. (2021), female
"*Teenage players are going to cut weight regardless, you can tell them not to, they're still going to do it. So, give them some proper nutrition advice, and tell them warning signs like girls, if you're not getting your period, that's not okay*"	Gordon et al. (2021), gender unclear
"*It's about reiterating the benefits of fueling, whereas some others I know have had a different mind-set of being lean is the best way to perform and now there's more of the science behind you need to fuel yourself to perform*"	Langan-Evans et al. (2022), female

balance; (5) athlete identity; (6) overvaluation and oversimplification; (7) shame, fear, and stigma; and (8) knowledge, education, and self-identification. These meta-themes have several implications for understanding disordered eating in elite athletes. Of critical concern is whether pathways to disordered eating are congruent with the general population, namely through the internalization of sociocultural ideals and body dissatisfaction (Stice, 2001) or if athletes experience unique sport factors. This review offers a rich explication of athletes' experiences and perceptions of the "sport pressures" that may contribute to disordered eating and help-seeking (Petrie & Greenleaf, 2007) which, when compared with existing quantitative findings and theoretical models, provide testable hypotheses to inform policy and practice.

Meta-themes in the present study indicated that risk factors for disordered eating in elite athletes included *specific* aspects of the sporting environment, congruent with longitudinal findings that self-reported pressures within the sporting environment to appear thin and lose weight predicted greater body dissatisfaction and disordered eating (Anderson et al., 2012; Chatterton et al., 2017; Krentz & Warschburger, 2013). The meta-themes in the current review highlight potentially relevant aspects of these "pressures" (e.g., hyperfocus on body, food, and exercise and the reinforcement of rigid [rigidity] and oversimplified body ideals [oversimplification]). Athletes often attributed these pressures to sport-specific rules, with weight classes and judgments based on esthetics considered risk factors for disordered eating, in line with quantitative reviews findings greater prevalence of disordered eating and eating disorders for athletes competing in "lean" sports (Chapa et al., 2022; Joy et al., 2016; Karrer et al., 2020; Mancine et al., 2020). Overall, athletes generally perceived there to be specific sport pressures impacting disordered eating.

The interplay between the meta-themes of the present study may also explain, at least in part, athletes' complex experiences with body dissatisfaction. Athletes' experiences of dual identities and body images (athlete balance) support previous findings that body dissatisfaction is generally lower in athletes than non-athletes (Smolak et al., 2000; Varnes et al., 2013), even when reporting greater disordered eating symptoms (De Bruin et al., 2007; Torstveit et al., 2008). Athletes may be satisfied with one aspect of their identity (athlete identity) or appearance whilst also reporting a drive to change their body for other reasons (e.g., fitting sociocultural ideals but not the rigid ideals of "being an athlete" [rigidity]). Tension in maintaining these dualities of identity and appearance may contribute to these "sport pressures," highlighting how the meta-themes often overlap in complex ways in relation to body image and disordered eating.

These meta-themes also align with established aetiological theories of eating disorders, albeit with some distinctions. Fairburn et al.'s (2003) cognitive behavioral model suggests that eating disorders are precipitated and maintained by an individual's overvaluation of weight and shape. Many athletes across the studies reported overvaluing performance and the adoption of an athletic identity to meet their emotional needs. Thus, the use of appearance and weight as proxy indicators for performance was considered a risk factor for disordered eating (overvaluation/oversimplification). The sporting environment may amplify this effect, with reinforcement by coaches and training staff, teammates, the media, sporting stereotypes, and sponsorship or financial opportunities (hyperfocus on body, food, and exercise). Given the frequent physical (due to travel) and psychological separation of athletes from the non-athletic world, they effectively remained in an echo chamber with minimal opportunities to challenge these beliefs (e.g., overvaluation). The overlap of these meta-themes with current models of disordered eating in the general population provides hypotheses for future quantitative research.

The meta-themes relating to barriers for help-seeking can be understood through a Health Belief Model framework (Janz & Becker, 1984). This model proposes that behavior change may be predicted by perceived susceptibility (how likely will I be impacted adversely), perceived severity (how impactful will it be if I am affected), perceived benefits (what will be the benefits of change), and perceived barriers (what impedes me from changing), with several meta-themes relevant for each of these factors (see Figure 3). Athletes often received messages from their sporting environment that dietary restriction and driven exercise were fundamental for health and performance (hyperfocus on body, food, and exercise), blurring lines between "normal" athletic training and disordered eating (the athlete balance). Such beliefs about disordered eating as healthy or normal were even evident in some interpretations made by the authors in the included articles. Coupled with the lack of education about disordered eating (knowledge), this could lead to low perceived susceptibility (e.g., "my peers do this, and they are fine") and severity (e.g., "it will improve my health and performance") of disordered eating. Accordingly, whilst some athletes did acknowledge the benefits of changing (e.g., improved well-being, better health, and long-term performance), this was typically in the context of perceived *clinical* eating disorders (e.g., vomiting, fasting all day without food), with "normalized" body image concerns or disordered eating behaviors (e.g., restrictive eating and compulsive exercise) generally overlooked. Barriers for help-seeking included the meta-themes of stigma, shame, and fear in line with previous quantitative findings (Martin & Anderson, 2019) and the perceived benefits of disordered eating (e.g., improved performance and validation from coaches). Finally, the coach–athlete power imbalance reflected low self-efficacy or perceived control over change. These hypotheses can guide future research to improve help-seeking for disordered eating in athletes.

Notably, although risk factors and help-seeking are discussed here separately, the meta-themes generally held relevance for both aspects. For example, stigma was considered a key barrier for help-seeking as well as a risk factor of disordered eating, with the "taboo" nature of the topic allowing disordered eating cognitions and behaviors to develop and go unchallenged. Each meta-theme, therefore, sat on a spectrum of relevance for risk/protective factors versus barriers for help-seeking, rather than dichotomously between the two.

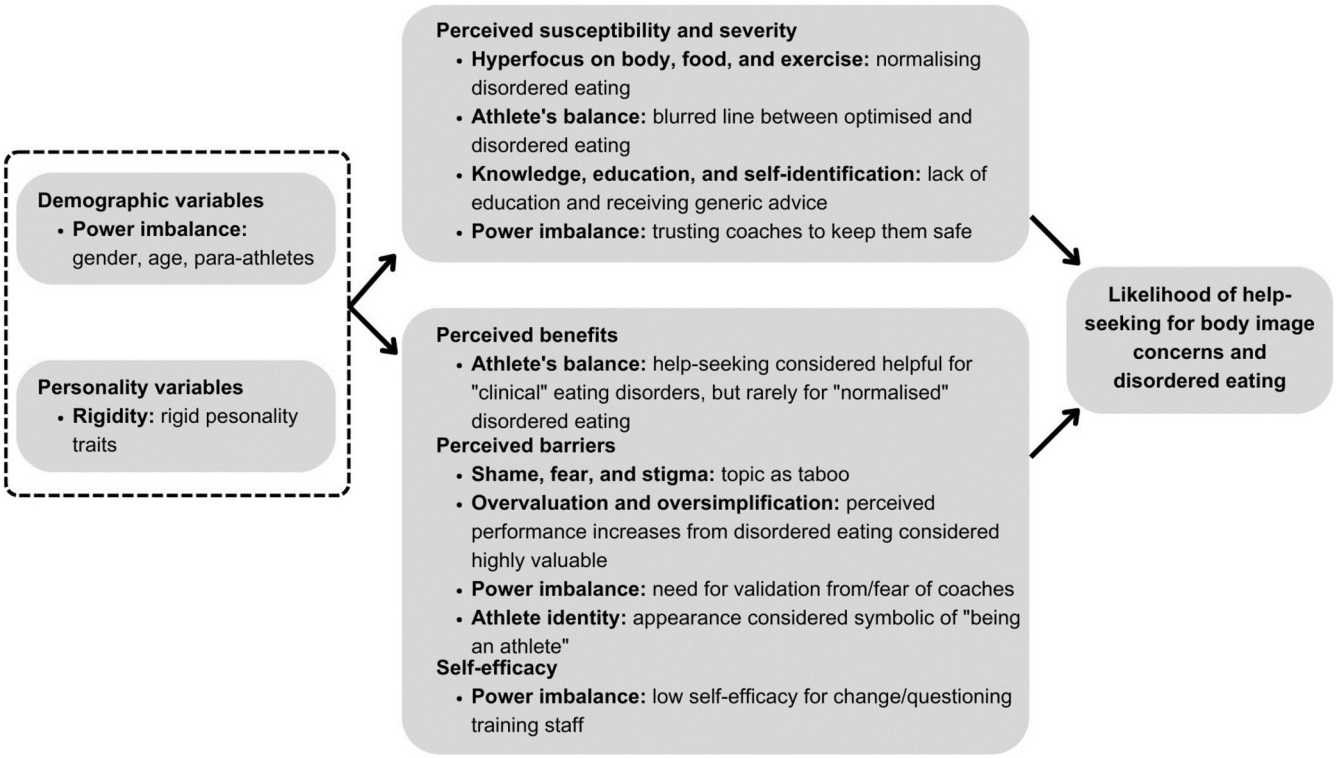

FIGURE 3 Hypothesized impacts of meta-themes on help-seeking for body image concerns and disordered eating, using the Health Belief Model.

4.1 | Implications

Overall, the thematic map (Figure 2) highlights several *athlete-specific* pressures (e.g., hyperfocus on body, food, and exercise, coach–athlete power imbalance, career changes) and internal factors (e.g., overvaluation and oversimplification, athlete identity, rigidity, shame, and knowledge), which may contribute to disordered eating and barriers for help-seeking (Figure 3). These findings give direction for future longitudinal research investigating if and how these constructs, or interplay across constructs, predict disordered eating and help-seeking in athletes. For example, a hyperfocus on body, food, and exercise in an athlete's environment might lead to disordered eating, mediated by their overvaluation of leanness for performance. Additionally, these meta-themes can inform the development of validated psychometric scales to quantitatively capture these constructs (e.g., the athlete balance) Finally, few interventions have been tested in athletes to date, and those that have are typically derived from general risk factors or lack theoretical grounding (Sandgren et al., 2020). These findings lay the groundwork for future development of targeted policies and interventions.

Finally, this review highlighted gaps in the demographic representation of specific groups in this research. Demographic details were not reported by several studies (e.g., few reported participant race and none reported socio-economic status). Gender and ethnic diversity were limited, with para-athletes only included in one study, consistent with the paucity of quantitative research investigating disordered eating or low energy availability in para-athletes (Blauwet et al., 2017). Several meta-themes indicated that para-athletes may face unique or exacerbated challenges (e.g., even greater power imbalance and stigma), and this may also be relevant for other minority groups (e.g., neurodiverse athletes, sexual orientation minorities, and gender-diverse athletes). Future research should prioritize these areas.

The following limitations should be considered. First, some relevant "gray" literature or non-English articles may have been excluded. However, given that qualitative reviews focus on drawing out meta-themes rather than weighing up effect sizes (as in quantitative reviews), a comprehensive inclusion of all relevant literature is typically not critically impactful on findings (Thomas & Harden, 2008). Still, future research should consider how meta-themes vary across cultures. For example, athletes from collectivist cultures could experiences power imbalances with coaching staff as well as their "athletic identity" differently to athletes from individualistic cultures. Additionally, qualitative methodologies involve subjective interpretations which may be influenced by biases in the research team (Thomas & Harden, 2008). The worldviews of the research team were framed by their clinical and research training (e.g., priming for factors consistent with the current literature or established models). However, these factors were considered in reflective discussion between the research team, with sufficient variance in experience and training to promote alternative interpretations. Further, the diversity in experiences was considered a strength of the research team for drawing out ideas and discussion (Thomas & Harden, 2008), in line with the aim to propose hypotheses for future empirical testing.

4.2 | Conclusion

Athletes across 38 studies provided rich accounts of their experiences with disordered eating, alongside interpretations by the authors. Thematic meta-synthesis indicated the relevance of individual, sociocultural, and "sport pressures" for risk/protective factors for disordered eating and barriers/facilitators for help-seeking. Complex interplays between meta-themes were hypothesized as particularly relevant. Such hypotheses require further testing through longitudinal designs, validation of relevant scales in elite athlete populations, and the modification of interventions focusing on elite athletes.

AUTHOR CONTRIBUTIONS

Scott J. Fatt: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; visualization; writing – original draft. **Emma George:** Conceptualization; formal analysis; funding acquisition; methodology; supervision; writing – review and editing. **Phillipa Hay:** Conceptualization; funding acquisition; supervision; writing – review and editing. **Nikki Jeacocke:** Conceptualization; formal analysis; methodology; supervision; writing – review and editing. **Sinead Day:** Project administration; validation; writing – review and editing. **Deborah Mitchison:** Conceptualization; formal analysis; methodology; supervision; writing – review and editing.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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