Research Project Portfolio

University of Nottingham
School of Medicine
Mental Health and Clinical Neurosciences

Doctorate in Clinical Psychology

2024

Individuals' Experiences of Their Relationship with Exercise and Mind-Body Connection in Recovery from Disordered Eating

Maisie Cropley BSc (Hons), MSc, PGCert

Thesis submitted in partial fulfilment of the requirements for the degree of Doctorate in Clinical Psychology

Acknowledgments

I would like to thank my supervisors Dr Hannah Merdian and Dr Sharron Smith, for their guidance and support throughout the research process.

For the participants who shared their experiences – thank you for your incredible contribution, this research would not have been possible without you.

To my partner Billy, thank you for your ongoing love and support. I would not have made it through the past three years without you.

Table of Contents

Thesis Abstract 1

Statement of Contribution 3

JOURNAL PAPER 4

Abstract 6
Practitioner Points 7
Plain English Summary 8

Introduction 9

Research Aim 17

Methods 17
Study Design 17
Participants 18
Procedure 19
Analysis 20

Results 22
Participant Characteristics 22
Themes 28
Understanding how the mind and body are connected 30
Manging emotions 33
Strong not skinny 35
What the body can physically do 37

Discussion 39
Summary of Research Findings 39
Change in Relationship with Exercise Through Enhanced Understanding of Mind-Body Connection 40
Understanding how the mind and body are connected 42
What the body can physically do 43
Managing emotions 44
Strong not skinny 46
Strengths, Limitations, and Future Research 47
Clinical Implications 49
Conclusion 50

References 52

EXTENDED PAPER 68

Extended Introduction 69
1.1 Historical Context of Disordered Eating 69
1.2 Defining Disordered Eating 69
1.3 Theoretical Models of Disordered Eating 70
1.3.1 Acceptance Model of Intuitive Eating 71
1.3.2 Cognitive Model of Bulimia Nervosa 72
1.3.3 Cognitive-Interpersonal Maintenance Model of Anorexia Nervosa 72

1.3.4 Functional Model of Emotional Avoidance in Anorexia Nervosa 73
1.3.5 Interpersonal Model of Binge Eating 74
1.3.6 Model of Disordered Eating 75
1.3.7 Transdiagnostic Maintenance Model of Eating Disorders 75
1.3.8 Sociocultural Model of Disordered Eating 76
1.3.8.1 Social Comparison Theory 77
1.3.8.2 Objectification Theory 77
1.3.8.3 Tripartite Influence Model of Body Dissatisfaction and Disordered Eating 78
1.3.9 Critique of Existing Theories 79
1.4 Psychological Interventions for Disordered Eating 80
1.4.1 Intuitive Eating 80
1.4.2 Cognitive-Based Self-Help for Bulimia 81
1.4.3 Maudsley Model of Anorexia Nervosa Treatment for Adults 81
1.4.4 Dissonance-Based Eating Disorder Prevention Programme 82
1.4.5 Emotion Acceptance Behaviour Therapy 82
1.4.6 Interpersonal Psychotherapy for Eating Disorders 83
1.4.7 Cognitive Behavioural Therapy for Eating Disorders 83
1.5 Exercise and Compulsive Exercise 84
1.5.1 Disordered Eating and Exercise 85
1.6 Cognitive Behavioural Maintenance Model of Compulsive Exercise 85
1.6.1 Eating Pathology 86
1.6.2 Psychological Dependence on Mood Regulation 86
1.6.3 Compulsivity 87
1.6.4 Perfectionism and Behavioural Rigidity 88
1.7 Interventions for Compulsive Exercise 88
1.7.1 Exercise in Recovery from Disordered Eating 89
1.8 The Mind and Body 90
1.8.1 The Mind 90
1.8.2 The Body 90
1.8.3 Mind-Body Connection 91
1.8.4 Mind-Body Connection and Disordered Eating 92
1.8.5 Mind-Body Connection, Exercise, and Disordered Eating 92
1.9 Extended Rationale 94

Extended Methodology **95**
2.1 Epistemological Position 95
2.2 Rationale for Qualitative Methodology 96
2.3 Selecting a Qualitative Methodology 97
2.3.1 Grounded Theory 97
2.3.2 Interpretative Phenomenological Analysis 98
2.3.3 Discourse Analysis 99
2.3.4 Reflexive Thematic Analysis 99
2.4 Study Design 101
2.4.1 Semi-structured Interviews 101
2.4.2 Inclusion and Exclusion Criteria 102
2.4.3 Recruitment Procedure 103
2.4.4 Sample Size 103
2.4.5 Data Collection 105
2.4.5.1 Demographic Information 105
2.4.5.2 Development of Interview Schedules 105
2.4.5.3 Recording and Transcription 106
2.4.6 Analysis 106
2.4.6.1 Reflexive Thematic Analysis Process 106

2.4.6.2 Deductive Analysis 108
2.4.6.3 Deductive Coding Framework 109
2.5 Reflexivity and Quality Assurance 111
2.6 Service User Involvement 114
2.7 Ethical Considerations 115
2.7.1 Incentives and Reimbursement 115
2.7.2 Informed Consent 115
2.7.3 Participant Withdrawal 116
2.7.4 Risk of Harm and Debriefing 116
2.7.5 Confidentiality 117
2.8 Data Protection and Storage 117
2.9 Research and Dissemination Policy 118

Extended Results **118**
3.1 Change in relationship with exercise through enhanced understanding of mind-body connection 118
3.1.1 Understanding how the mind and body are connected 120
3.1.2 Managing emotions 121
3.1.3 Strong not skinny 122
3.2 What the body can physically do 123

Extended Discussion and Reflection **126**
4.1 Findings in Relation to Previous Literature and Theory 126
4.2 Strengths, Limitations and Future Research 129
4.3 Clinical Implications 131
4.3.1 Exercise in Recovery from Disordered Eating 131
4.3.2 Increasing Awareness of Mind-Body Connection 132
4.3.3 Improving Emotion Regulation Skills 133
4.4 Critical Reflection 134
4.4.1 Conceptualising the Research 134
4.4.2 Deciding on the Qualitative Methodology 136
4.4.3 Reflections on Sample Size 137
4.4.4 Interview Process 138
4.4.5 Analysis Process 140
4.4.6 Closing Reflections 141

References **142**

Appendices **175**
Appendix A *Ethical Approval Letter* 175
Appendix B *Study Consent Form* 176
Appendix C *Participant Information Sheet* 178
Appendix D *Participant Debrief Sheet* 183
Appendix E *Study Advert* 184
Appendix F *Semi-Structured Interview Schedule* 185
Appendix G *Qualitative Interview Initial Coding Exert* 186
Appendix H *Qualitative Interview Deductive Coding Excerpts* 187

POSTER 189

Thesis Abstract

Background: Disordered Eating is defined as eating behaviours which are restrictive, compulsive, or inflexible in nature. Compulsive exercise has found to be a transdiagnostic feature of disordered eating. Research has typically been concerned with the relationship those actively struggling with disordered eating have with exercise, as well as a small body of research into the use of exercise in the treatment of disordered eating. However, these have failed to incorporate a focus on mind-body connection and explore individuals' relationship with their mind-body connection and exercise. Despite evidence to suggest that mind-body connection is not only impacted by disordered eating, but that exercises that have been useful in disordered eating recovery include aspects which support mind-body connection. The aim of this research was to explore the relationships those in recovery from disordered eating have with exercise and mind-body connection.

Method: This study utilised a qualitative approach with data collected from semi-structured interviews. Data was analysed using reflexive thematic analysis. Demographic data was collected from participants to contextualise the findings.

Results: Fourteen participants (11 females, 2 non-binary people, and 1 male) were recruited via social media. One superordinate theme, '*change in relationship with exercise through enhanced understanding of mind-body connection'* and four interrelated subthemes were found: '*understanding how the mind and body are connected*', '*what the body*

can physically do', 'managing emotions', and 'strong not skinny'.

Participants' relationships with exercise and mind-body connection had changed in recovery from disordered eating. The participants described an increased awareness of their mind-body connection in recovery from disordered eating, and this awareness was linked with a change in their relationships with exercise.

Conclusions: The findings of this study provide a nuanced understanding of how mind-body connection can support changes in relationships with exercise in recovery from disordered eating. In recovery exercise remained useful for the participants in supporting emotion regulation, and learning to listen to the body may have helped to prevent this becoming an unhealthy dependence on exercise for emotion regulation. Mind-body connection and exercise supported one another; it was through exercise that many participants were able to greater understand their mind-body connection. The findings of this study highlight the need for future research into how exercise can be used to support recovery from disordered eating, and how mind-body connection could be useful in achieving a healthier relationship with exercise.

Statement of Contribution

Journal Paper

Project Design: Maisie Cropley, Dr Hannah Merdian, and Dr Sharron Smith
Application for Ethical Approval: Maisie Cropley
Participant Recruitment: Maisie Cropley
Data Collection: Maisie Cropley under the supervision of Dr Hannah Merdian and Dr Sharron Smith
Data Analysis: Maisie Cropley under the supervision of Dr Hannah Merdian and Dr Sharron Smith
Write-up: Maisie Cropley under the supervision of Dr Hannah Merdian and Dr Sharron Smith

JOURNAL PAPER

Individuals' Experiences of Their Relationship with Exercise and Mind-Body Connection in Recovery from Disordered Eating [1]

Maisie Cropley[1.2], Dr Hannah Merdian[2], and Dr Sharron Smith[3]

[1.2] University of Nottingham, UK

[2] University of Lincoln, UK

[3] University of Lincoln, UK

Corresponding author: Maisie Cropley, Trent Doctorate in Clinical Psychology, University of Nottingham, Division of Psychiatry & Applied psychology (School of Medicine). Yang Fujia Building Bfloor, B11. Nottingham, United Kingdom, NG8 1BB.

Email: maisie.cropley@nottingham.ac.uk

This journal is prepared for submission to the Journal of Eating Disorders. For journal submission tables and figures will be listed at the end of the review, for the purpose of course submission these have been listed in text. Submission guidelines can be found on the journal's website: https://jeatdisord.biomedcentral.com/submission-guidelines/preparing-your-manuscript/research-article

[1] Disclaimer: Under supervision from Dr Hannah Merdian and Dr Sharron Smith, Maisie Cropley developed and wrote a research protocol, parts of which are now included in the final thesis.

Abstract

Background: Research has typically been concerned with the relationship those actively struggling with disordered eating have with exercise, as well as a small body of research into the use of exercise in the treatment of disordered eating. However, these have failed to incorporate a focus on mind-body connection and explore individuals' relationship with their mind-body connection and exercise**.** The aim of this research was to explore the relationships those in recovery from disordered eating have with exercise and mind-body connection.

Methods: This study utilised a qualitative approach with data collected from semi-structured interviews and analysed using reflexive thematic analysis.

Results: Fourteen participants were recruited via social media. One superordinate theme, '*change in relationship with exercise through enhanced understanding of mind-body connection'* and four interrelated themes were found: *'understanding how the mind and body are connected', 'what the body can physically do', 'managing emotions', and 'strong not skinny'.* Participants' relationships with exercise and mind-body connection had changed in recovery from disordered eating. In recovery participants described having an increased awareness of their mind-body connection, and a change in their relationships with exercise.

Conclusions: The findings of this study suggest that mind-body connection plays a role in achieving healthier relationships with exercise

in recovery from disordered eating. Therefore, mind-body connection is useful to consider when working with individuals with disordered eating. Future research into how exercise can be used to support recovery from disordered eating would be beneficial, as exercise allowed participants to increase their awareness of mind-body connection.

Key words: disordered eating, compulsive exercise, mind-body connection, recovery

Practitioner Points

- In recovery from disordered eating relationships with exercise change, and this appears to be through an increased awareness of one's mind and body.
- Exercise is important in recovery for supporting emotion regulation. Although this could become dependent and mean that individuals continue to engage in compulsive exercise.
- Mind-body connection is ignored during disordered eating, and through greater awareness and respect of this individuals can support their recovery.
- Psychoeducation on mind-body connection would be useful during recovery from disordered eating.

Plain English Summary

This study explored individuals' experiences of their relationships with exercise and mind-body connection in recovery from disordered eating. Disordered eating is characterised by eating behaviours that are restrictive, compulsive, or inflexible. It can also include exercising compulsively to support weight loss and manage emotions. Mind-body connection refers to the links between a person's thoughts, feelings, and behaviours. To explore individuals' experiences this study conducted semi-structured interviews with 14 participants. The data from the interviews was analysed using reflexive thematic analysis. The results of this study found that in recovery from disordered eating individuals' relationships with exercise had changed, this appeared to be supported by an increased understanding and awareness of their mind-body connection.

Introduction

Disordered Eating

Disordered Eating (DE) is defined as eating behaviours which are restrictive, compulsive, or inflexible in nature (1; 2)[2]. Examples of DE behaviours include fasting or chronic food restriction, binge eating, purging, cutting out food groups, laxative and diuretic misuse, using diet pills, and an unhealthy relationship with exercise (3). Another symptom of DE is a separation of the perceived self from the body, or a poor Mind-Body Connection (MBC), the body becomes something that can be controlled or managed by the individual through their DE behaviours (4). Consequences of DE include poor sleep, fatigue, constipation and/or diarrhoea, lowered immune system, poorer quality of life (5), and increased mortality and suicidality (6)[3].

DE can affect anyone and is found across the lifespan (7-9), although some groups are at higher risk than others: individuals who are of a higher body weight (10), non-heterosexual adolescents, and transgender people (9, 11). At present, accurate prevalence rates are not known in the United Kingdom (UK) as there have been no large-scale investigations into the prevalence of DE (12). It is estimated that a quarter of women have experienced DE in a 12-month period, and a moderate level of DE is now normalised in young women (12). Evidence is also increasing about the existence of DE in males (13, 14)[4].

[2] See extended paper (section 1.1) for historical context of disordered eating.
[3] See extended paper (section 1.2) for diagnostic criteria for disordered eating.
[4] See extended paper (section 1.3) for theoretical models of disordered eating.

Despite the increasing prevalence rates of DE, and advances in programmes aimed at preventing DE (15), there is still limited evidence for effective interventions (12). Existing interventions focus on normalising body weight, improving eating behaviours, and formulating the cause of DE (12)[5]. Most public health interventions aimed at preventing DE have been developed independently of theoretical considerations and lack empirical support (16), therefore more research is required to develop effective interventions for DE.

Beat (17), a UK based Eating Disorder (ED) charity, state that "recovery" from DE and EDs is different for everyone, for some it means never having another ED thought, for others those thoughts remain however they happen less frequently, and the individual can avoid acting on them. First Steps ED, another UK based ED charity describe recovery as "a life no longer controlled by a preoccupation with weight, shape, or food" (18). Yet in research there is a lack of consensus about what is defined as recovery from DE (19).

Compulsive Exercise and Disordered Eating

Compulsive exercise has found to be a transdiagnostic feature of DE (20-22)[6]. Compulsive exercise is a term commonly used when an individual is driven to exercise in a rigid way, feeling unable to stop their engagement with exercise (23). Those with DE can be driven to exercise to increase

[5] See extended paper (section 1.4) for disordered eating interventions.
[6] See extended paper (section 1.5) for further information on exercise and definitions of compulsive exercise.

weight loss, and to manage guilt around eating (20). The exercise may be aimed at reducing or preventing distress, it is also time-consuming, and significantly interferes with daily life (23). Compulsive exercise and DE are linked in several ways, including body dissatisfaction, weight concerns, and perfectionism (22).

The Cognitive Behavioural Theory (CBT) maintenance model of compulsive exercise (22) links four areas to compulsive exercise: ED pathology particularly weight and shape concerns, psychological dependence on mood regulation, compulsivity, and behavioural rigidity[7]. The model proposes that individuals are driven to continue to engage in compulsive exercise as it is positively and negatively reinforced. The positive reinforcement comes from the euphoria induced by exercise, while the negative reinforcement comes from the negative mood states which individuals fear will occur by stopping exercise (22).

Among those with DE, compulsive exercise is significantly associated with eating pathology (24), in particular a drive for thinness (25) and weight and shape concerns (26). Mond and colleagues (27) demonstrated that exercise which is undertaken with the purpose to influence weight and shape is the dimension of compulsive exercise most strongly associated with DE. Although, it is difficult to know whether engagement with exercise results from concerns about weight and shape, or if weight and shape concerns can be triggered by engagement with exercise. The initial weight loss induced by exercise can lead to social

[7] See extended paper (section 1.6) for further details on CBT maintenance model of compulsive exercise.

reinforcers (e.g. praise for weight loss), which leads to a greater interest in physical appearance, and in turn increased engagement with exercise (22, 28). The links between compulsive exercise and eating pathology being underpinned by weight and shape concerns are thought to be such an important feature, that compulsive exercise is not considered a clinical problem in those without these concerns (27, 29).

It understood that DE is a coping strategy to manage difficult emotions (30), and it has been proposed that compulsive exercise serves the same emotion regulatory function in those with DE (31). Among the general population, the mood regulatory effects of exercise have been found to be the biggest motivator for engaging with exercise (32, 33). Similar motivation has been found among those with DE, with suggestions that exercise is maintained to control negative affect (34, 35).

Supporting the negative reinforcement of engaging with compulsive exercise, it has been found that compulsive exercise is associated with higher levels of worries about the consequences of not exercising (36). This supports theories of compulsivity, which define compulsive behaviours as behaviours which are engaged with due to a drive to avoid anxiety (or other distressing emotions) associated with not engaging with the behaviour (36). One emotion that those with DE wish to avoid is guilt, which can occur if they are prevented from engaging in exercise in the way they want (27, 37). Guilt when being unable to exercise has been found to be a way to discriminate between those with and without DE (38; 39).

The final component of the CBT maintenance model of compulsive exercise is behavioural rigidity and perfectionism (22). Many obsessive-compulsive personality traits have been associated with DE (40), but it is perfectionism which is most strongly associated with both DE (41) and compulsive exercise (42). Compulsive exercise has been associated with high personal standards and self-criticism, with compulsive exercisers striving to achieve perfectionism in their exercise (24). To reduce the anxiety about performing perfectly, individuals engage in exercise in a rigid way, repetitive way (38).

At present the National Institute for Health and Care Excellence (43) guidelines for the treatment of EDs and DE recommend that individuals stop engaging with exercise whilst in treatment, due to the increased risk of physical health difficulties among this population (44). However, it is known that compulsive exercise is one of the last symptoms to subside (20), which suggests this advice is not being followed. This abstinence approach may act as a maintaining factor in an individual's unhealthy relationship with exercise, as complete abstinence would also not be considered healthy (45). Abstaining from exercise during treatment may prevent individuals from learning how to create a healthy relationship with exercise to allow them to engage in exercise in a non-compulsive way in recovery[8].

Mind-Body Connection and Disordered Eating

[8] See extended paper (section 1.7) for interventions for compulsive exercise.

It is important before defining MBC, to first define the *mind*, and the *body*. The mind can be understood as a combination of four facets: subjective experience, consciousness, self-organisation, and information processing (80). The body can be understood as a person's physical being, including bones, flesh, and organs (81), the body can also experience physical sensations resulting from emotional experiences (82). The mind and body have been described as inseparably intwined, with the mind an embodied phenomenon (83). This embodiment results from the mind being a result of neuronal activity within the brain (84), and the brain being a component of one's physical self.

Viewing the mind and body as intwined leads to the conceptualisation of MBC, which is defined as the link between one's thoughts, feelings, behaviours, and physical sense of self (46). It is thought that the mind can influence the body, and vice versa (46). Several terms are used within the literature to describe this phenomenon including body awareness, and embodiment (47)[9]. These different terms have made it difficult to complete reviews of literature relating to MBC (47). For this study, the term MBC is being used as it was felt that is places equal emphasis on the mind and the body, more than others term, such as body awareness.

DE is unique as a mental health problem as the symptoms affect a person's mind and body, making MBC an important area of study among

[9] See extended paper (section 1.8) for detailed definition of mind-body connection.

this population (48). Granieri and Schimmenti (49) describe that those with DE experience mind-body "splitting": a deficit in the ability to integrate and mentalise bodily experiences. It has been suggested that this occurs as a form of self-protection: allowing the body to become a safe place to withdraw into. Ironically, DE often causes individuals to become hyper-aware of their minds and bodies, preoccupied with emotions surrounding eating, such as guilt, and fixation on their body's physical appearance (50). It could be argued that through attempts to "split" their mind and body those with DE in fact unite them through their DE behaviours, whilst simultaneously creating a conflict between the two. During attempts to leave their embodied selves, they avoid the experiences of their bodies and emotions where possible through engaging with their DE behaviours (e.g., compulsive exercise). However, through engaging with such behaviours they must be connected to their minds and bodies, with those with DE frequently preoccupied with thoughts about bodily sensations, e.g., weight, shape, bloating, as well as the emotional consequences of their DE behaviours (50). These conflicting views of MBC among individuals with DE highlight the importance of understanding more about the experiences of MBC among individuals who have experienced DE.

Mind-Body Connection, Exercise, and Disordered Eating

Despite there being no current clinical guidelines for the use of exercise in treating DE and EDs (51), exercise in treatment for EDs is happening

globally (52). Several literature reviews have concluded that exercise is safe, providing the individuals' nutritional needs are met (53, 54). In their review of exercise protocols used in ED and DE treatment Calogero and Pedrotty (52) found that despite the benefits of including exercise in treatment, such treatments tended to neglect the individuals' mind-body connection, tending to focus only on their physical bodies.

Therefore, Calogero and Pedrotty (52) recommend exercise that supports MBC for those in recovery from DE, in order develop a healthy relationship with exercise. Calogero and Pedrotty (52, 55) suggest that variety, flexibility, and enjoyment are the key factors to achieve a healthy relationship with exercise. The small body of research to date on the use of exercise in recovery from DE and EDs has explored participation in yoga and found this to be beneficial in prevention and treatment (56, 57). This could be due to the focus on MBC during yoga (56, 57), which supports individuals to understand more about the needs of their body, including when to exercise and when to rest, and the role of exercise in emotion regulation. Whilst yoga is currently the most studied form of exercise within this population, other forms of exercise might also support MBC, this has just not yet been explored (58).

Rationale

At present research has typically been concerned with the relationship those actively struggling with DE have with exercise, as well as a small body of research into the use of exercise in the treatment of DE.

However, these have failed to incorporate a focus on MBC and explore individuals' relationship with their MBC and exercise (20, 52).

Research is needed to explore how individuals conceptualise MBC (if at all), with many terms currently being used in the literature (47). As well as research into the relationships those in recovery from DE have with exercise and MBC. This could aid clinicians' and researchers' understanding of the role exercise and MBC can play in DE and recovery from DE (20, 59)[10].

Research Aim

This study aimed to expand on the limited existing data in the field by exploring how individuals in recovery from DE experience and make sense of their relationships with exercise and MBC. As well as allowing for those in recovery from DE to have their experiences heard, it also aimed to further researchers' and clinicians' understanding of this population.

Methods

Study Design

This study utilised a qualitative approach[11], data were collected from semi-structured interviews and analysed using Reflexive Thematic Analysis (RTA) (60, 61) taking an inductive deductive approach. This analysis is compatible with the researchers' epistemological position of

[10] See extended paper (section 1.9) for extended rationale.
[11] See extended paper (section 2.2) for further discussion on qualitative methods and rationale.

Critical Realism (62-64). The study received ethical approval from the University of Nottingham's Department of Psychiatry and Applied Psychology Ethics Committee (Reference: 2993)[12].

Participants

Between December 2022 and April 2023, participants were recruited via Facebook and Instagram through the accounts of ED and exercise recovery charities *First Steps ED* and the *Female Athlete Triad*[13]. Participants received a £10 Amazon voucher following participation as a thanks for their time. Recruitment of participants did not conclude until the research team determined there was a richness and quality of data to meet the research aims. The samples' demographic characteristics were also considered when deciding when to discontinue recruitment[14]. For example, it was deemed important that the sample consisted of male and female participants, as DE is not found in only one gender. The inclusion criteria[15] stipulated that participants must be aged 18 years or above, be able to speak English, have access to the internet (interviews were conducted online), and be in recovery from DE (self-reported). Participants were unable to take part if there were currently accessing treatment for their DE.

[12] See extended paper (section 2.7) for further information on ethics.
[13] See extended paper (section 2.4.3) for further information on recruitment procedure.
[14] See extended paper (section 2.4.4) for further justification of sample size.
[15] See extended paper (section 2.4.2) for further information on inclusion and exclusion criteria.

Procedure

Upon contacting the lead researcher to express an interest in participating, potential participants were provided with the Participant Information Sheet and Consent Form. Participants were asked to return the Consent Form via email, after which their interview was arranged. Data were collected using semi-structured interviews[16] conducted over Microsoft Teams, data was recorded using Microsoft Team's audio transcription feature[17].

Interviews

In line with the mixed inductive and deductive approach, the development of the interview questions was considered in the context of the relevant theory and empirical evidence, whilst also including open-ended questions with the aim of facilitating novel insights[18][19]. The interview schedule began by asking participants about their experiences of DE, their current relationship with exercise and motivations to engage (or not) with exercise, and finally their understanding of MBC in recovery, and if this is related to their relationship with exercise.

Interviews were automatically transcribed during the interview. Transcripts were not reviewed or analysed by the researcher until one week after the interview to allow time for participants to exercise their

[16] See extended paper (section 2.4.5) for further details on data collection.
[17] See extended paper (section 2.4.5.3) for further details on recording and transcription.
[18] See extended paper (section 2.4.1 and 2.4.5.2) for further information on the semi-structured interviews.
[19] See extended paper (section 2.6) for service user involvement in creating the interview schedules.

right to completely withdraw their data from the study. Participants were informed that they were able to withdraw after one week, but that data already obtained may have been analysed and therefore may be unable to be erased.

Following the interviews participants were sent a Participant Debrief Form, which thanked them for their participation, and provided them with signposting for support should they need it. They were also sent their Amazon voucher via email.

Analysis

RTA[20] was used to analyse the data. Braun and Clarke (65) outline six-phases of RTA: familiarisation with the data, generating initial codes, searching for initial themes, developing and reviewing themes, defining and naming themes, and producing the report.

RTA views researcher subjectivity as a resource during theme development and is flexible in its theoretical framework (65). This study used an inductive deductive approach; codes were generated at the semantic and latent level to allow for exploration of the meaning associated with participants' experiences (66). Using this approach meant that the themes could be data-driven whilst also being explored in the context of relevant theory and literature (60, 61).

[20] See extended paper (section 2.4.6) for further details of analysis.

The process of identifying themes in RTA begins with reading, re-reading and familiarisation with the data. Initial codes are identified during this stage. Once codes have been generated, themes are identified and reviewed.

A deductive coding framework was used during the deductive analysis phase[21]. The framework was developed from the researchers' existing knowledge of theories and models in the field of DE, MBC, and compulsive exercise which related to the aims of the study and had been reviewed in the literature review. The deductive analysis took place after phase three (searching for initial themes) but before phase four (developing and reviewing themes). This allowed for the data to be viewed through the lens of the relevant theoretical literature (66) and for theory-led questions to be posed to the extracts that built each theme.

The deductive coding framework, alongside discussions about emerging insights and reflections between the researchers, allowed the final themes to be created and debated until agreement was reached. In this process and in line with RTA, the researchers drew on their experiences of qualitative research, exercise, yoga therapy, and ED and DE treatments. The lead researcher also reflected throughout on the influence of her personal experiences and how this may influence her approach to the data.

[21] See extended paper (section 2.4.6.2) for further details of the deductive coding framework.

Results

Participant Characteristics

Participants (*n=14*) were aged between 18-33 years old (mean age: 25.29), with 11 identifying as female, two as non-binary, and one as male. Further participant demographic information can be seen in Table 1. Participants were asked to describe in their own words the DE behaviours they experienced, their engagement with exercise, and how long they felt they had struggled with DE and been in recovery, see Table 1.

The demographic details were collected from the participants to provide context to their experiences and perspectives. The findings ought to be considered in the context of the participant sample.

Table 1. Participant Demographics and Experiences of Disordered Eating and Engagement with Exercise

Participant Pseudonym	**Age**	**Gender**	**Ethnicity**	**Disordered Eating Behaviours**	**Time with Disordered Eating**	**Time in Recovery**	**Engagement with Exercise**
Sally	24	Female	White British	Binge eating	10 years	3 years	Health condition which impacts ability to exercise, exercising in recovery
Jackie	32	Female	White British	Anorexia, compulsive exercise	18 years	6 months	Exercising in recovery
Kye	23	Non-binary/gender-fluid	White Irish	Restrictive eating	12 years	4 years	Exercising in recovery

Ginny	28	Female	White British	Restrictive eating, compulsive exercise	6 years	5 years	Exercising in recovery
Daphne	18	Female	White British	Restrictive eating, compulsive exercise	1 year	2 years	Competitive rower, exercising in recovery
Georgia	23	Female	White British	Atypical anorexia	8 years	1 year	Exercising in recovery
Cat	24	Female	White British	Restrictive eating, compulsive exercise	5 years	1 year	Previous competitive swimmer (stopped competing in recovery), exercising in recovery

Maxie	25	Non-binary	British Pakistani	Binge eating, eating disorder not otherwise specified, compulsive exercise	8 years	1 year	Health condition which impacts ability to exercise, not exercising in recovery
Lisa	31	Female	White British	Restrictive eating, compulsive exercise	20 years	18 months	Exercising in recovery
Carol	21	Female	White British	Orthorexia	3 years	4 years	Exercising in recovery

Dianna	24	Female	White British	Bingeing, purging, restrictive eating, compulsive exercise	9 years	1 year	Stoma which impacts ability to exercise, exercising in recovery
Harriet	20	Female	White Welsh	Restrictive eating, compulsive exercise	4 years	2 years	Competitive swimmer, exercising in recovery
Sam	28	Male	White British	Restrictive eating, compulsive exercise	4 years	11 years	Exercising in recovery

Vienna	33	Female	White Dutch	Anorexia, compulsive exercise	12 years	1 year	Exercising in recovery

Themes[22]

One superordinate theme, *'change in relationship with exercise through enhanced understanding of mind-body connection'* and four subthemes were found: *'understanding how the mind and body are connected', 'what the body can physically do', 'managing emotions', and 'strong not skinny'.*

Superordinate Theme: Change in relationship with exercise through enhanced understanding of mind-body connection

MBC was not something that the participants spoke about until prompted by the researcher using the semi-structured questions about MBC. However, prior to this, the participants described features of MBC, even if they did not name them as such, particularly when thinking about their relationships with exercise.

"I do think that exercise does give you a deeper understanding of that [mind-body connection] […] So exercise can definitely help with that"

Daphne

The conceptualisation of MBC and how participants understood this in relation to their experience of their DE and their relationships with exercise was a central tenet throughout the themes. For participants learning to prioritise their bodies and listening to its cues was important in

[22] See extended paper (section 3) for further discussion on identified theme and additional illustrative quotes.

moving from an unhealthy relationship with exercise during their DE, to a healthy one in recovery.

Generally, participants described that they felt that exercise was able to support MBC. This was through strengthening MBC when it had been suppressed or disconnected during their DE, and aiding awareness of how the mind and body are linked.

"I think it [exercise] does, support mind body connection because I think it strengthens your perception of how far your body can go" Charlotte

"when you're an athlete like you spend so much time, like connecting to your body all the time, listening to it, listening to what it's saying. So exercise can definitely help with that" Daphne

Daphne and Charlotte both expressed that they believed that exercise can be useful in understanding MBC, and in turn MBC can support engagement with exercise.

"Yoga that was more about the breath and the mind and the the thoughts that kind of flow with the moves […] That really syncs the two [mind and body] up together, I found that quite helpful" Lisa

Six of the participants described that they felt yoga specifically was a helpful form of exercise in supporting MBC. Lisa highlights yoga's focus

on mindfulness, and the syncing of the mind and the body through the breath.

Understanding how the mind and body are connected

Participants' personal understanding of MBC shared ideas of mindfulness, respecting and listening to the body, and awareness of the links between the mind and the body. Their understanding of their MBC appeared to be something that developed during recovery from DE.

"I appreciate the like intrinsic link and and I guess what it means to me is […] a happy mind equals a happy body and a happy body equals a happy mind […] like an equilibrium" Lisa

Understanding that emotions are experienced both physically (in the body) and mentally (in the mind) was recognised by participants, a key feature of MBC.

"I feel anxiety in my body if my my brain is anxious, I will feel that in my stomach. You know, being tense. And and they say the mind is connected with the gut, don't they? […] Certainly, the kind of anxious kind of feelings you know, resonate in my body" Jackie

"I think the body can store a lot of emotion and the body can give a lot of signs that it's not doing well and ideally, obviously you would listen to say

your hunger cues or your body is tired and needs to rest […] It should ideally be perfectly connected and work together" Vienna

Something that was common across the participants, was that in recovery they felt more aware of their MBC, particularly the cues their minds and bodies were giving them.

"my mind will tell me things about my body doesn't mean that I'll listen to it all the time […] understanding that actually when I'm doing exercise or whatever it may be or restricting […] knowing that actually I am telling myself something by doing that and you know, thinking it's OK to listen to that sometimes" Sam

For many participants, what MBC meant to them was listening to how their bodies were feeling and noticing any pain or fatigue and using this knowledge to guide their decisions in whether to exercise or not. Although, this was still difficult for some participants, and they acknowledged that even in recovery they do not always listen to these cues. However, there is still an improvement in how they worked with their MBC, in recovery they moved from suppressing cues from their MBC, to being able to acknowledge them if not always being able to listen to them.

Sam considers that there is a meaning behind listening to or ignoring what his mind and body are telling him. It may be that he is

more able to notice the DE thoughts, and how they impact his behaviour now that he has more awareness of his MBC.

"there's definitely a role for people understanding how their mind and their body are connected so that they can actually understand and work together to tackle both problems rather than just saying, well, exercise is one thing and eating one thing and the mind is one thing and the body is one thing and actually go well, actually they're like 4 wheels of a car, and if one ones falling off, you know you can have a pretty big problem with the car in general just going forward" Sam

Though participants described MBC during their DE, they worked to "split" their minds and bodies to allow them to push through to continue to exercise.

"I am trying to listen to my mind and body a lot better like I am trying more. I think there are sometimes maybe I do still suppress it, but I'm trying to get the balance" Daphne

Being able to listen to and respect these cues, if not all the time, appeared to be something new that they experienced in recovery.

Manging emotions

Most participants described using exercise to regulate their emotions while in recovery from DE, this appeared to be a big motivator to continue to engage with exercise.

"You feel like more able to cope with day, whereas when I've not been [to the gym] for a couple of days like I can feel that I feel physically down"

Sam

Sam described that when he does not engage with exercise, he finds that his mood is low. Anxiety was particularly present as an emotion that participants found exercise helped them to process or find release from. This appeared to be both the physical and mental symptoms of anxiety.

"I will say it [exercise] sometimes it's to help anxiety 'cause I'm a very anxious human and sometimes I'm so restless and fidgety if I'm still" Lisa

"there is nothing that I have found that relaxes me as much as running"

Ginny

As well as using exercise as an outlet for emotions such as anxiety, and to reduce low mood, participants also utilised exercise to improve their mood.

" [dancing] makes my mind happy I'll drive home from that class and what oh much better mood now. So glad I went that kind of thing, so it definitely does. I do think there's an intrinsic link between exercise and feeling happy" Lisa

"going for a run for me or focusing on exercise is a really good way to get. Is it endorphins? Yeah. And I can really feel that nowadays" Vienna

Feeling happy after exercise was a motivator for the participants to engage with exercise in their recovery. For many, exercising to alleviate stress and anxiety had been present before and during their DE. However, exercising to increase happiness, and for enjoyment was something new. This could help in identifying what it means to be in recovery in terms of an individual's relationship with exercise, rather than relying on it to relieve difficult emotional experiences, in recovery exercise is able to be enjoyed and increases happiness.

"It's just what you want to do and almost feel like you like it brings you happiness almost. So that is something that has massively changed for me" Daphne

"it's going because I want that rush of feeling good rather than going because I'm feel like I have to or that I should" Harriet

Exercising for enjoyment, was a change noted by all participants who engaged with exercise before and after their DE. Some had initially engaged with exercise for enjoyment, which waned when the exercise became compulsive, but they found that this enjoyment returned once they no longer felt they *had* to exercise.

Strong not skinny

Many of the participants discussed that they had originally engaged with exercise to help them lose weight or prevent weight gain while struggling with their DE. However, in recovery their motivation to exercise shifted from wanting to lose weight to wanting to gain strength.

"it's more about building strength rather than losing weight" Vienna

"feeling strong rather than feeling skinny" Carol

For Carol, the motivation to become stronger not only came from wanting to feel strong for herself and enjoying the feeling of strength. She also wanted to build strength as a form of self-protection.

"It's quite sad, but mainly the fact that like as a woman, I don't feel safe walking down the street. […] It just feels like safer if I was, if I had to.

Like, I don't know, kick someone. I wouldn't. I wouldn't feel like I was like hugely like the weaker person." Carol

Wanting to build strength was also a motivator for Kye to engage in exercise in recovery, even though they had previously not engaged with exercise during their DE. They too engaged in a form of strength building exercise which could be used for self-protection.

"I wanted to be strong. And I remember my mom saying […] you wanna be strong not skinny, strong not skinny. […] exercise did come into the recovery part, but not the illness so much, if that makes sense. Umm, the […] jujitsu was yeah, it really helps. It helps channel not just the anger, but it helps to channel that feeling of strength" Kye

The way Kye describes feeling strong appears to include the physical feeling of strength, as well as the mental/emotional feeling of strength connecting the mind and body. Kye describes her "mom" advising her that she wants to be "strong not skinny", this could be interpreted as gaining muscle rather than having a thin physique. Kye takes it further, to include mental strength, describing how the jujitsu helps not just with "*anger*", an emotion, but also the "*feeling of strength"*. This links back to the emotion regulatory effects of exercise which participants had described in the earlier theme '*managing emotions'*, demonstrating how interconnected the themes were.

What the body can physically do

Three of the participants described chronic physical health conditions that impacted on their ability to engage with exercise, as well as their relationships with their bodies in recovery from DE. Dianna's physical health condition occurred while she was in recovery, whereas Maxie and Sally's health problems had been more longstanding. Regardless of time of onset, they all found their chronic health condition impacted on their relationship with exercise in recovery from DE.

During her recovery Dianna had a stoma fitted, which has had a significant impact on her ability to engage with exercise. She had previously engaged in compulsive exercise as part of her DE, and being forced to reduce her exercise due to the stoma may have played a part in her recovery.

"I currently have a stoma. Um so like physically that is … Like plays a massive part on like what my body can physically do" Dianna

"I do think that it [the stoma] has made me much more aware of like how my body is feeling and I am able to listen to it more […] I feel much more able to listen to my body. And like when I'm in pain or like physically can't do something then I do feel like I'm able to, kind of I'm able to say it. I'm able to act on it and I'm able to let myself rest and say no to things"

Dianna

Dianna's experience of a stoma increased her body awareness, which enabled her to build a different relationship with exercise. Maxie also found that their physical health conditions impacted on their ability to exercise, and for them looking after their body and being able to have a life they enjoy meant they chose to no longer engage in exercise.

"it's like I need to respect my body because it's what gets me through every day […] if I want to enjoy life, which I do, and if I want to enjoy the company of people around me, I need to be in a place where I can do that" Maxie

Despite Dianna and Maxie having different health conditions, and different relationships with exercise, both found that their physical health conditions led to a greater understanding of and respect for their bodies, which supported their motivation to recover from DE.

Sally also described wanting to listen to and look after her body, and how having had kidney failure this became even more of a priority. To take better care of herself, Sally began to engage in exercise to improve her physical health. This differed from Dianna's and Maxie's experiences of not being able to, or choosing not to, engage with exercise due to their physical health.

"I needed to look after my body so. Especially as the fact that my um my dad gave me his kidney for my transplant and I kind of took those things

for granted and then the guilt kind of played a part in that as well that I wanted to see my body. I wanted to make sure my body was good, so I was looking after that" Sally

Wanting and needing to take better care of her body, not only motivated Sally to engage with exercise, but she was also more motivated to recover from her DE.

Whilst these three participants' physical health conditions differed, all three described being motivated to recover from their DE to improve their physical health. Moreover, their physical health played a role in changing their relationship with exercise in recovery from DE, and even though this took different forms, all reported an improved relationship with exercise.

Discussion[23]

Summary of Research Findings

This qualitative study aimed to explore the experiences of those in recovery from DE and their relationships with exercise and MBC. One superordinate theme, '*change in relationship with exercise through enhanced understanding of mind-body connection'* and four subthemes were found: *'understanding how the mind and body are connected', 'what the body can physically do', 'managing emotions', and 'strong not skinny'.*

[23] See extended paper (section 4) for further discussion on findings in relation to previous literature and theory.

The key findings were that participants' relationships with exercise and MBC changed during their recovery from DE. Participants described that they had an increased awareness of their MBC, and this appeared to be helpful in improving their relationships with exercise. Two participants continued to exercise to engage with competitive sport, 11 engaged with exercise non-competitively, and one chose not to engage with exercise at all. There were two dominant motivators for engaging with exercise, which were emotion regulation, and the want to feel and be strong.

This study helped to explore individuals' experiences of their relationships with MBC and exercise in recovery from DE. It found that an increased awareness of MBC helped to support recovery from DE by reducing the mind body "split" (49) as well as improving individuals' relationships with exercise.

The findings suggest that in recovery from DE individuals are better able to manage their DE behaviours and reduce exercise compulsivity and behavioural rigidity (22) through enhanced awareness of their MBC.

Change in Relationship with Exercise Through Enhanced Understanding of Mind-Body Connection

This theme overarched the four subthemes, as it was participants' enhanced understanding of MBC and their change in relationship with exercise that allowed them to have the experiences which were captured in the four subthemes.

The participants' experiences of MBC reflected existing knowledge that when experiencing DE individuals work to split their minds and bodies and supress the cues, they receive from the two (49). For three of them this suppression or "splitting" allowed them to exercise and train for professional sports, however this became compulsive as they began to push beyond training needs while struggling with DE. This is not uncommon among athletes and has recently led to an increased awareness of Relative Energy Deficiency in Sport (RED-S) which results from over-training (86). In recovery, the greater awareness of MBC helped to guide participants' engagement with exercise. The participants were able to notice pain and fatigue in their bodies, as well as thoughts about their motivation to exercise and their moods. This allowed them to exercise to support feeling good both mentally and physically.

Generally, being in recovery from DE motivated participants to want to reconnect with and honour their MBC and to use this to guide their engagement with exercise. Clinically, this could help to distinguish between compulsive exercise, and a healthy relationship with exercise supporting an understanding of where someone is in their recovery from DE and compulsive exercise. For example, while struggling with DE the individual works to separate their mind and body and do not engage honour the cues they receive (49), in recovery they begin to have more awareness of their MBC, and finally they use their MBC to guide their engagement with exercise. Theoretically, this would fit with Acceptance and Commitment Therapy (ACT) ideas in the field of DE (85). Supporting

the core processes in ACT of being present, and therefore being able to listen to the MBC, and then engaging in committed action, choosing whether to respect the cues from their MBC and engage in exercise or not.

Understanding how the mind and body are connected

As previously discussed, many terms have been used in the literature to conceptualise MBC (47), therefore it is not surprising that most of the participants were new to the term MBC. Despite this, they were able to understand this concept and discuss their relationship with MBC in recovery from DE. Their understanding of MBC appeared to have developed during their recovery from DE. There were similarities across participants' understanding of MBC, which included mindfulness, awareness of emotions, and awareness of physical cues from the body. Although they had not labelled their experiences as MBC before engaging in the interviews, their descriptions and experiences reflected the clinical and theoretical definitions of MBC which define it as the link between one's thoughts, feelings, behaviours, and physical sense of self (46, 47).

Evidence is emerging that engagement with exercise, of any kind, can support MBC, even if it does not involve traditional mindfulness techniques (58). The participants engaged in a variety of different exercises including yoga, swimming, rowing, climbing, cycling, and strength training. Engagement in all of these was associated with increased awareness of MBC. Several participants described yoga as being

a form of exercise they found particularly helpful in improving their MBC. They described finding the mindfulness practices within yoga helpful in allowing them to sync their minds and bodies. Yoga has been found to be associated with greater awareness of the body, lower self-objectification, increased body satisfaction, and reduced DE attitudes (87). The existing research on the benefits of yoga (57) and the current study's findings that support its ability to improve MBC (56) highlight the usefulness of yoga in DE recovery.

What the body can physically do

For most of the participants exercise allowed them to improve their MBC and learn more about the limits of their physical bodies. For three participants however, their physical health was the main factor in changing their relationships with MBC and exercise. Their physical health conditions necessitated them changing their relationship and engagement with exercise. However, they too had worked to supress their MBC while struggling from their DE and therefore had to make an active choice to listen to their bodies and respect their limits resulting from their health conditions. Not only is the suppression of MBC common among those with DE (49) research also suggests that those with physical health conditions are also likely to work through these cues, which can result in over-exercising as they overcompensate for physical and psychological processes (88). Therefore, it may have been even more difficult for this group of participants to recognise an unhealthy relationship with exercise

and be able to make changes. Increased awareness and respect of their bodies supported these participants' recovery from DE, as they were more motivated to care for themselves, for two of them this included engaging with exercise. The importance of engaging in exercise to improve physical health further supports suggestions that those with DE should be able to engage in exercise in recovery, and a focus on MBC could help to support individuals to engage in exercise in a healthy way (52, 55).

Managing emotions

Exercise has been found to be helpful in supporting emotion regulation among those with depression and related mental health conditions, and in the general population (69, 70). Those who regularly engage with exercise report less rumination, greater coping self-efficacy and perceived ability to cope with stress and negative moods, compared to those who are less active (71, 72). Based on this knowledge some have recommended regular exercise for those with maladaptive tendencies as a preventive measure against depression (73). However, a reliance on these regulatory benefits of exercise can lead to compulsive exercise among those with DE (22). Participants' descriptions of the impact of exercise on their mood demonstrated engagement with exercise being both positively and negatively reinforced, as a way of feeling good and increasing happiness, and to avoid or reduce anxiety and anger.

Therefore, it could be suggested that the participants that described using exercise for emotion regulation may still be struggling with compulsive exercise, as exercising for emotion regulation was one of the main reasons participants chose to exercise in recovery for DE. It could also be that the participants framed exercise as a helpful emotional coping mechanism to excuse the high levels of exercise they are still engaged with. However, in the CBT maintenance model of compulsive exercise it is proposed that the reinforcing component related to emotion regulation is the avoidance of the guilt and anxiety associated with not exercising, which drives the compulsive exercise (22, 35). Whilst the participants described feeling anxious or more irritable if they did not exercise, this was attributed to coping with daily life, rather than these emotions being caused by the inability to exercise. The findings of this study suggest psychological dependence on mood regulation in determining DE (38) is more nuanced, and that the driver of the emotion is also important to consider. This is further supported by participants largely describing that the emotion regulation they were seeking was the mood boosting effects of exercise, which is commonly seen in the general population who do not experience compulsive exercise (89). Using exercise to feel good was also new to participants in recovery, and therefore may also serve as a useful aid for their general mental health, which is often recommended for those with other mental health difficulties (74, 75, 89). As exercise is commonly recommended in public health settings to improve mood (89), and clinically to reduce symptoms of

mental health problems (74, 75, 89), those with DE should not be excluded from these benefits in recovery, providing they are physically stable to engage in exercise (53, 54).

Strong not skinny

Much like the emotion regulation component of compulsive exercise can be used to distinguish between those with DE and those without, the drive to exercise for weight and shape concerns is said to be another distinguishing feature between those with and without DE (22, 27, 35). Participants described that they felt their relationship with exercise had improved as they were now motivated to exercise to become *strong*, rather than to lose weight and be *skinny*. While this appears to be positive, in that they are no longer striving for thinness, there is still a bodily shape appraisal to looking strong. Their descriptions of wanting to move toward being strong, rather than focusing on being skinny, or losing weight reflects the "strong is the new skinny" "fitspiration" trend which has been seen across social media (76,77). Research has found that those who subscribe to the "fitspiration" social media posts including those under the tagline of "strong is the new skinny", may be engaging with compulsive exercise habits (68). These posts promote a focus on body shape through having a strong physique. Therefore, participants' descriptions of wanting to be strong not skinny may not represent a move toward a more positive relationship with exercise and their bodies. Whilst it is perceived as healthier to be driven to exercise for strength and

fitness ideals as an alternative to the thin ideal, this may still be perpetuating poor body image, DE, and compulsive exercise (78). Those who have been found to engage in such forms of "fitspiration" on social media have been found to score more highly on DE, ED, and compulsive exercise scales (68, 77). Further research would be useful to explore this further with participants and understand if they were aware of such "fitspiration", and what being strong means to them and whether there is a body image element attached to this.

Strengths, Limitations, and Future Research[24]

This research adds to the growing literature on DE by exploring the experiences of those in recovery have of their relationship with exercise and MBC. The study was able to provide a rich insight into the experiences of those in recovery from DE through the qualitative methodology. This was also aided by the contribution of experts by experience from First Steps ED who provided consultation during the development of the interview schedule and supported the recruitment of participants.

However, the study must be considered in view of several methodological limitations. Whilst rich data was gathered, more data was available on relationships with exercise than relationships with MBC, as participants were new to the term MBC. Future research may benefit from

[24] See extended paper (section 4.2) for further critique of the study's limitations and recommendations for future research.

exploring separately relationships with MBC, and relationships with exercise, for those in recovery from DE to gain a greater insight into these relationships. As both were explored in this study participants were more likely to make links between the two, or to believe that this is what the researcher was looking for during the interviews. If relationships with exercise and MBC were explored separately, and participants continued to make connections between the two this would provide support for the findings of this study, and previous research which suggests that exercise that incorporates MBC can be beneficial for those in recovery from DE (52, 55).

A further limitation is that the study cannot be generalised to the wider population of those in recovery from DE. While it was a strength that females, a male, and non-binary people participated, most participants were female. Evidence suggests that prevalence rates of DE are similar across males and females (7, 8) and potentially higher in transgender people (8), therefore the population of this study was not representative of the DE population. Future research would benefit from exploring experiences of males, non-binary, and transgender people, to gain greater insight into experiences of relationships with MBC and exercise in recovery from DE across the population.

Clinical Implications[25]

This study highlighted the importance of being able to listen to the mind and the body to be able to engage with exercise in a healthy way in recovery from DE, while also using exercise to support the mind through emotion regulation. Participants were largely able to listen to their MBC to guide their engagement with exercise, and most wanted to exercise in recovery. Therefore, exercise should be considered in the treatment of DE, and potentially EDs too, given that exercise can facilitate deeper understanding of MBC (52, 58). MBC appeared to the main factor that could be used to differentiate between a healthy relationship with exercise and a compulsive one. Although, being able to listen to cues from their physical body was not always something that came easily for participants, they described having to make the choice to listen to and act on the cues from their bodies. A further difficulty the participants faced in recovery from DE when attempting to listen to their MBC to guide their engagement with exercise was when their mind and body were giving conflicting cues. For example, they physically felt tired or injured and therefore did not think it would be beneficial to exercise, but they also felt anxious or stressed and believed exercise would be beneficial for these emotions. This could raise questions about how recovered they are from their DE, if listening to cues remains a conscious effort, but supports theories that DE recovery is a process that participants continue to engage with (20, 79). It also raises a difficulty in navigating recovery and

[25] See extended paper (section 4.3) for further discussion on clinical implications of the current study.

understanding how to support individuals' all-round wellbeing in knowing whether to prioritise what their mind or what their body is communicating to them. One way to manage these difficulties clinically would be to use the CBT maintenance model of compulsive exercise (22) to guide interventions and highlight risks in engagement with exercise. For example, being able to recognise when exercise has become rigid, or there is a dependence on exercise for emotion regulation.

Conclusion

To the researchers' knowledge, this is the first study exploring the experiences of relationships with exercise and MBC in those in recovery from DE. The findings provide a nuanced understanding of how MBC can support changes in relationships with exercise in recovery from DE, as well as supporting the ongoing recovery journey. In recovery exercise remained useful in supporting emotion regulation and listening to the body may have helped to prevent this becoming an unhealthy dependence on exercise for emotion regulation. MBC and exercise supported one another, as it was through exercise that many participants were able to understand MBC and feel encouraged to listen to their MBC in recovery from DE. The findings of this study highlight the need for future research into how those in recovery from DE make sense of their relationship with exercise and their MBC, considering how MBC could be useful in achieving a healthier relationship with exercise.

Word Count:

8714

7990 (excluding: abstract, plain English summary, table & footnotes)

List of abbreviations:

CBT = Cognitive Behavioural Therapy

DE = Disordered eating

ED = Eating disorder

MBC = Mind-body connection

RTA = Reflexive thematic analysis

References

(1) Mancine RP, Gusfa DW, Moshrefi A, Kennedy SF. Prevalence of disordered eating in athletes categorized by emphasis on leanness and activity type–a systematic review. Journal of Eating Disorders. 2020 Dec;8(1):1-9. https://doi.org/10.1186/s40337-020-00323-2

(2) Tanofsky-Kraff M, Yanovski SZ. Eating disorder or disordered eating? Non-normative eating patterns in obese individuals. Obesity Research. 2004 Sep;12(9):1361-6. https://doi.org/10.1038/oby.2004.171

(3) Goldschmidt AB, Aspen VP, Sinton MM, Tanofsky-Kraff M, Wilfley DE. Disordered eating attitudes and behaviors in overweight youth. Obesity. 2008 Feb;16(2):257-64. https://doi.org/10.1038/oby.2007.48

(4) Cook-Cottone C. Embodiment and the treatment of eating disorders: the body as a resource in recovery. WW Norton & Company; 2020 Sep 22.

(5) Wade TD, Wilksch SM, Lee C. A longitudinal investigation of the impact of disordered eating on young women's quality of life. Health Psychology. 2012 May;31(3):352. https://doi.org/10.1037/a0025956

(6) Crow SJ, Swanson SA, Peterson CB, Crosby RD, Wonderlich SA, Mitchell JE. Latent class analysis of eating disorders:

relationship to mortality. Journal of Abnormal Psychology. 2012 Feb;121(1):225. https://doi.org/10.1037/a0024455

(7) Mitchison D, Hay P, Slewa-Younan S, Mond J. The changing demographic profile of eating disorder behaviors in the community. BMC Public Health. 2014 Dec;14(1):1-9. https://doi.org/10.1186/1471-2458-14-943

(8) Murray SB, Blashill AJ, Calzo JP. Prevalence of disordered eating and associations with sex, pubertal maturation, and weight in children in the US. JAMA paediatrics. 2022 Oct 1;176(10):1039-40. https://doi.org/10.1001/jamapediatrics.2022.2490

(9) Reba-Harrelson L, Von Holle A, Hamer RM, Swann R, Reyes ML, Bulik CM. Patterns and prevalence of disordered eating and weight control behaviors in women ages 25–45. Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity. 2009 Dec;14:e190-8. https://doi.org/10.1007/BF03325116

(10) Loth K, Wall M, Larson N, Neumark-Sztainer D. Disordered eating and psychological well-being in overweight and non-overweight adolescents: Secular trends from 1999 to 2010. International Journal of Eating Disorders. 2015 Apr;48(3):323-7. https://doi.org/10.1002/eat.22382

(11) Calzo JP, Austin SB, Micali N. Sexual orientation disparities in eating disorder symptoms among adolescent boys and girls in the UK. European Child & Adolescent Psychiatry. 2018 Nov; 27:1483-90. https://doi.org/10.1007/s00787-018-1145-9

(12) Pennesi JL, Wade TD. A systematic review of the existing models of disordered eating: do they inform the development of effective interventions?. Clinical Psychology Review. 2016 Feb 1; 43:175-92. https://doi.org/10.1016/j.cpr.2015.12.004

(13) Byrne SE, Basten CJ, McAloon J. The development of disordered eating in male adolescents: a systematic review of prospective longitudinal studies. Adolescent Research Review. 2023 May 26:1-26. https://doi.org/10.1007/s40894-023-00217-9

(14) Lavender JM, De Young KP, Anderson DA. Eating Disorder Examination Questionnaire (EDE-Q): norms for undergraduate men. Eating Behaviors. 2010 Apr 1;11(2):119-21. https://doi.org/10.1016/j.eatbeh.2009.09.005

(15) Stice E, Marti CN, Rohde P, Shaw H. Testing mediators hypothesized to account for the effects of a dissonance-based eating disorder prevention program over longer-term follow-up. Journal of Consulting and Clinical Psychology. 2011 Jun;79(3):398. https://doi.org/10.1037/a0023321

(16) Becker CB, Plasencia M, Kilpela LS, Briggs M, Stewart T. Changing the course of comorbid eating disorders and depression: what is the role of public health interventions in targeting shared risk factors?. Journal of Eating Disorders. 2014 Dec; 2:1-4. https://doi.org/10.1186/2050-2974-2-15

(17) Beat. https://www.beateatingdisorders.org.uk/get-information-and-support/get-help-for-myself/recovery/ [Accessed 26 January 2024]

(18) First Steps ED. https://firststepsed.co.uk/about-us/core-values/ [Accessed 26 January 2024]

(19) Richmond TK, Woolverton GA, Mammel K, Ornstein RM, Spalding A, Woods ER, Forman SF. How do you define recovery? A qualitative study of patients with eating disorders, their parents, and clinicians. International Journal of Eating Disorders. 2020 Aug;53(8):1209-18. https://doi.org/10.1002/eat.23294

(20) Bardone-Cone AM, Hunt RA, Watson HJ. An overview of conceptualizations of eating disorder recovery, recent findings, and future directions. Current Psychiatry Reports. 2018 Sep; 20:1-8. https://doi.org/10.1007/s11920-018-0932-9

(21) Harris A, Mannan H, Hay P, Aouad P, Arcelus J, Attia E, Crosby R, Madden S, Meyer C, Touyz S. Assessment and treatment of compulsive exercise in anorexia nervosa – a combined investigation of compuLsive Exercise Activity theraPy (LEAP) and Compulsive Exercise Test subscales. Eating Behaviors. 2024 Jan 1; 52:101825. https://doi.org/10.1016/j.eatbeh.2023.101825

(22) Meyer C, Taranis L, Goodwin H, Haycraft E. Compulsive exercise and eating disorders. European Eating Disorders Review. 2011 May;19(3):174-89. https://doi.org/10.1002/erv.1122

(23) Taranis L, Touyz S, Meyer C. Disordered eating and exercise: development and preliminary validation of the Compulsive Exercise Test (CET). European Eating Disorders Review. 2011 May;19(3):256-68. https://doi.org/10.1002/erv.1108

(24) Shroff H, Reba L, Thornton LM, Tozzi F, Klump KL, Berrettini WH, Brandt H, Crawford S, Crow S, Fichter MM, Goldman D. Features associated with excessive exercise in women with eating disorders. International Journal of Eating disorders. 2006 Sep;39(6):454-61. https://doi.org/10.1002/eat.20247

(25) Solenberger SE. Exercise and eating disorders: a 3-year inpatient hospital record analysis. Eating Behaviors. 2001 Jun 1;2(2):151-68. https://doi.org/10.1016/S1471-0153(01)00026-5

(26) Dalle Grave R, Calugi S, Marchesini G. Compulsive exercise to control shape or weight in eating disorders: prevalence, associated features, and treatment outcome. Comprehensive Psychiatry. 2008 Jul 1;49(4):346-52. https://doi.org/10.1016/j.comppsych.2007.12.007

(27) Mond JM, Hay PJ, Rodgers B, Owen C, Beumont PJ. Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. Behaviour Research and Therapy. 2004 May 1;42(5):551-67. https://doi.org/10.1016/S0005-7967(03)00161-X

(28) Fairburn CG, Cooper Z, Shafran R. Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and

treatment. Behaviour Research and Therapy. 2003 May 1;41(5):509-28. https://doi.org/10.1016/S0005-7967(02)00088-8

(29) Keski-Rahkonen A. Exercise dependence–a myth or a real issue?. European Eating Disorders Review: The Professional Journal of the Eating Disorders Association. 2001 Jul;9(4):279-83.

(30) Meule A, Richard A, Schnepper R, Reichenberger J, Georgii C, Naab S, Voderholzer U, Blechert J. Emotion regulation and emotional eating in anorexia nervosa and bulimia nervosa. Eating Disorders. 2021 Mar 4;29(2):175-91. https://doi.org/10.1080/10640266.2019.1642036

(31) Lawson R, Waller G, Lockwood R. Cognitive content and process in eating-disordered patients with obsessive–compulsive features. Eating Behaviors. 2007 Aug 1;8(3):305-10. https://doi.org/10.1016/j.eatbeh.2006.11.006

(32) Markland D, Hardy L. The Exercise Motivations Inventory: preliminary development and validity of a measure of individuals' reasons for participation in regular physical exercise. Personality and Individual Differences. 1993 Sep 1;15(3):289-96. https://doi.org/10.1016/0191-8869(93)90219-S

(33) Herbert C, Meixner F, Wiebking C, Gilg V. Regular physical activity, short-term exercise, mental health, and well-being among university students: the results of an online and a laboratory study. Frontiers in Psychology. 2020 May 26; 11:509. https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00509/full

(34) Davis C, Woodside DB. Sensitivity to the rewarding effects of food and exercise in the eating disorders. Comprehensive Psychiatry. 2002 May 1;43(3):189-94. https://doi.org/10.1053/comp.2002.32356

(35) Geller J, Cockell SJ, Hewitt PL, Goldner EM, Flett GL. Inhibited expression of negative emotions and interpersonal orientation in anorexia nervosa. International Journal of Eating Disorders. 2000 Jul;28(1):8-19. https://doi.org/10.1002/1098-108X(200007)28:1<8::AID-EAT2>3.0.CO;2-U

(36) Peñas-Lledó E, Vaz Leal FJ, Waller G. Excessive exercise in anorexia nervosa and bulimia nervosa: relation to eating characteristics and general psychopathology. International Journal of Eating Disorders. 2002 May;31(4):370-5. https://doi.org/10.1002/eat.10042

(37) Mond J, Myers TC, Crosby R, Hay P, Mitchell J. 'Excessive exercise' and eating-disordered behaviour in young adult women: further evidence from a primary care sample. European Eating Disorders Review: The Professional Journal of the Eating Disorders Association. 2008 May;16(3):215-21. https://doi.org/10.1002/erv.855

(38) Boyd C, Abraham S, Luscombe G. Exercise behaviours and feelings in eating disorder and non-eating disorder groups. European Eating Disorders Review: The Professional Journal of the

Eating Disorders Association. 2007 Mar;15(2):112-8. https://doi.org/10.1002/erv.769

(39) Mond JM, Calogero RM. Excessive exercise in eating disorder patients and in healthy women. Australian & New Zealand Journal of Psychiatry. 2009 Mar;43(3):227-34. https://doi.org/10.1080/00048670802653323

(40) Halmi KA. Obsessive-compulsive personality disorder and eating disorders. Eating Disorders. 2004 Dec 14;13(1):85-92. https://doi.org/10.1080/10640260590893683

(41) Halmi KA, Sunday SR, Strober M, Kaplan A, Woodside DB, Fichter M, Treasure J, Berrettini WH, Kaye WH. Perfectionism in anorexia nervosa: variation by clinical subtype, obsessionality, and pathological eating behavior. American Journal of Psychiatry. 2000 Nov 1;157(11):1799-805. https://doi.org/10.1176/appi.ajp.157.11.1799

(42) Flett GL, Hewitt PL. The perils of perfectionism in sports and exercise. Current Directions in Psychological Science. 2005 Feb;14(1):14-8. https://doi.org/10.1111/j.0963-7214.2005.00326.x

(43) National Institute of Clinical Excellence. https://www.nice.org.uk/guidance/ng69. 2020. [Accessed 26 January 2024].

(44) Quesnel DA, Libben M, D. Oelke N, I. Clark M, Willis-Stewart S, Caperchione CM. Is abstinence really the best option? Exploring

the role of exercise in the treatment and management of eating disorders. Eating Disorders. 2018 May 4;26(3):290-310. https://doi.org/10.1080/10640266.2017.1397421

(45) Noetel M, Dawson L, Hay P, Touyz S. The assessment and treatment of unhealthy exercise in adolescents with anorexia nervosa: a Delphi study to synthesize clinical knowledge. International Journal of Eating Disorders. 2017 Apr;50(4):378-88. https://doi.org/10.1002/eat.22657

(46) Littrell J. The mind-body connection: not just a theory anymore. Social Work in Health Care. 2008 Feb 28;46(4):17-37. https://doi.org/10.1300/J010v46n04_02

(47) Acolin J. The mind–body connection in dance/movement therapy: theory and empirical support. American Journal of Dance Therapy. 2016 Dec;38(2):311-33. https://doi.org/10.1007/s10465-016-9222-4

(48) Myszko O, Torga AP, Lawrence D, Rosenthal LA. Exploring the mind-body connection from puberty to the interSEXtion of eating disorders and reproductive health: what mental health providers should know. Bulletin of the Menninger Clinic. 2023 Jun;87(2):135-61. https://doi.org/10.1521/bumc.2023.87.2.135

(49) Granieri A, Schimmenti A. Mind–body splitting and eating disorders: a psychoanalytic perspective. Psychoanalytic Psychotherapy. 2014 Jan 2;28(1):52-70. https://doi.org/10.1080/02668734.2013.872172

(50) Cook-Cottone CP. Incorporating positive body image into the treatment of eating disorders: a model for attunement and mindful self-care. Body Image. 2015 Jun 1; 14:158-67. https://doi.org/10.1016/j.bodyim.2015.03.004

(51) Hallward L, Di Marino A, Duncan LR. A systematic review of treatment approaches for compulsive exercise among individuals with eating disorders. Eating Disorders. 2022 Jul 4;30(4):411-36. https://doi.org/10.1080/10640266.2021.1895509

(52) Calogero RM, Pedrotty KN. The practice and process of healthy exercise: an investigation of the treatment of exercise abuse in women with eating disorders. Eating Disorders. 2004 Dec 1;12(4):273-91. https://doi.org/10.1080/10640260490521352

(53) Hausenblas HA, Cook BJ, Chittester NI. Can exercise treat eating disorders?. Exercise and Sport Sciences Reviews. 2008 Jan 1;36(1):43-7. https://doi.org/ 10.1097/jes.0b013e31815e4040

(54) Moola FJ, Gairdner SE, Amara CE. Exercise in the care of patients with anorexia nervosa: a systematic review of the literature. Mental Health and Physical Activity. 2013 Jun 1;6(2):59-68. https://doi.org/10.1016/j.mhpa.2013.04.002

(55) Calogero R, Pedrotty K. Daily practices for mindful exercise. In Low-cost approaches to promote physical and mental health: theory, research, and practice 2007 May 15 (pp. 141-160). New York, NY: Springer New York.

(56) Flaherty M. Influence of yoga on body image satisfaction in men. Perceptual and Motor Skills. 2014 Aug;119(1):203-14. https://doi.org/10.2466/27.50.PMS.119c17z1

(57) Douglass L. Yoga as an intervention in the treatment of eating disorders: does it help?. Eating Disorders. 2009 Feb 27;17(2):126-39. https://doi.org/10.1080/10640260802714555

(58) Gavin J, McBrearty M. Exploring mind-body modalities: a revealing review of the latest scientific studies dealing with the psychological benefits of different mindful types of exercise. IDEA Fitness Journal. 2006 Jun 1;3(6):58-67.

(59) Holland LA, Brown TA, Keel PK. Defining features of unhealthy exercise associated with disordered eating and eating disorder diagnoses. Psychology of Sport and Exercise. 2014 Jan 1;15(1):116-23. https://doi.org/10.1016/j.psychsport.2013.10.005

(60) Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006 Jan 1;3(2):77-101. https://doi.org/10.1191/1478088706qp063oa

(61) Braun V, Clarke V. Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health. 2019 Aug 8;11(4):589-97. https://doi.org/10.1080/2159676X.2019.1628806

(62) Lawani A. Critical realism: what you should know and how to apply it. Qualitative Research Journal. 2021 Aug 2;21(3):320-33. https://doi.org/10.1108/QRJ-08-2020-0101

(63) Cook TD, Campbell DT, Day A. Quasi-experimentation: design & analysis issues for field settings. Boston: Houghton Mifflin; 1979 Jul.

(64) Pilgrim D. Critical realism for psychologists. Routledge; 2019 Nov 27.

(65) Braun V, Clarke V. Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. Counselling and Psychotherapy Research. 2021 Mar;21(1):37-47. https://doi.org/10.1002/capr.12360

(66) Clarke V, Braun V. Successful qualitative research: a practical guide for beginners. Successful Qualitative Research. 2013:1-400.

(67) Robinson P, Turk D, Jilka S, Cella M. Measuring attitudes towards mental health using social media: investigating stigma and trivialisation. Social Psychiatry and Psychiatric Epidemiology. 2019 Jan 28; 54:51-8. https://doi.org/10.1007/s00127-018-1571-5

(68) Holland G, Tiggemann M. "Strong beats skinny every time": disordered eating and compulsive exercise in women who post fitspiration on Instagram. International Journal of Eating Disorders. 2017 Jan;50(1):76-9. https://doi.org/10.1002/eat.22559

(69) Belcher BR, Zink J, Azad A, Campbell CE, Chakravartti SP, Herting MM. The roles of physical activity, exercise, and fitness in promoting resilience during adolescence: effects on mental well-being and brain development. Biological Psychiatry: Cognitive

Neuroscience and Neuroimaging. 2021 Feb 1;6(2):225-37. https://doi.org/10.1016/j.bpsc.2020.08.005

(70) Bernstein EE, McNally RJ. Exercise as a buffer against difficulties with emotion regulation: a pathway to emotional wellbeing. Behaviour Research and Therapy. 2018 Oct 1; 109:29-36. https://doi.org/10.1016/j.brat.2018.07.010

(71) Craft LL. Exercise and clinical depression: examining two psychological mechanisms. Psychology of Sport and Exercise. 2005 Mar 1;6(2):151-71. https://doi.org/10.1016/j.psychsport.2003.11.003

(72) Kishida M, Elavsky S. Daily physical activity enhances resilient resources for symptom management in middle-aged women. Health Psychology. 2015 Jul;34(7):756. https://doi.org/10.1037/hea0000190

(73) Harvey SB, Øverland S, Hatch SL, Wessely S, Mykletun A, Hotopf M. Exercise and the prevention of depression: results of the HUNT cohort study. American Journal of Psychiatry. 2018 Jan 1;175(1):28-36. https://doi.org/10.1176/appi.ajp.2017.16111223

(74) Escobar-Roldan ID, Babyak MA, Blumenthal JA. Exercise prescription practices to improve mental health. Journal of Psychiatric Practice®. 2021 Jul 1;27(4):273-82. https://doi.org/10.1097/PRA.0000000000000554

(75) Kramer A. An overview of the beneficial effects of exercise on health and performance. Physical Exercise for Human Health. 2020:3-22. https://doi.org/10.1007/978-981-15-1792-1_1

(76) Boepple L, Ata RN, Rum R, Thompson JK. Strong is the new skinny: a content analysis of fitspiration websites. Body Image. 2016 Jun 1; 17:132-5. https://doi.org/10.1016/j.bodyim.2016.03.001

(77) Tiggemann M, Zaccardo M. 'Strong is the new skinny': a content analysis of #fitspiration images on Instagram. Journal of Health Psychology. 2018 Jul;23(8):1003-11. https://doi.org/10.1177/1359105316639436

(78) Donovan CL, Uhlmann LR, Loxton NJ. Strong is the new skinny, but is it ideal?: a test of the tripartite influence model using a new measure of fit-ideal internalisation. Body Image. 2020 Dec 1; 35:171-80. https://doi.org/10.1016/j.bodyim.2020.09.002

(79) Wetzler S, Hackmann C, Peryer G, Clayman K, Friedman D, Saffran K, Silver J, Swarbrick M, Magill E, van Furth EF, Pike KM. A framework to conceptualize personal recovery from eating disorders: a systematic review and qualitative meta-synthesis of perspectives from individuals with lived experience. International Journal of Eating Disorders. 2020 Aug;53(8):1188-203. https://doi.org/10.1002/eat.23260

(80) Siegel DJ. The mind in psychotherapy: an interpersonal neurobiology framework for understanding and cultivating mental

health. Psychology and Psychotherapy: Theory, Research and Practice. 2019 Jun;92(2):224-37.

(81) Johnson M. The meaning of the body. In Developmental perspectives on embodiment and consciousness 2007 Sep 19 (pp. 35-60). Psychology Press.

(82) Nummenmaa L, Glerean E, Hari R, Hietanen JK. Bodily maps of emotions. Proceedings of the National Academy of Sciences. 2014 Jan 14;111(2):646-51. https://doi.org/10.1073/pnas.1321664111

(83) Walker N, Raymaker DM. Toward a neuroqueer future: An interview with Nick Walker. Autism in Adulthood. 2021 Mar 1;3(1):5-10. https://doi.org/10.1089/aut.2020.29014.njw

(84) Damasio AR. How the brain creates the mind. Scientific American. 1999 Dec 1;281(6):112-7.

(85) Onnink CM, Konstantinidou Y, Moskovich AA, Karekla MK, Merwin RM. Acceptance and commitment therapy (ACT) for eating disorders: A systematic review of intervention studies and call to action. Journal of Contextual Behavioral Science. 2022 Oct 1;26:11-28. https://doi.org/10.1016/j.jcbs.2022.08.005

(86) Mountjoy M, Sundgot-Borgen J, Burke L, Ackerman KE, Blauwet C, Constantini N, Lebrun C, Lundy B, Melin A, Meyer N, Sherman R. International Olympic Committee (IOC) consensus statement on relative energy deficiency in sport (RED-S): 2018 update. International Journal of Sport Nutrition and Exercise

Metabolism. 2018 Jul 1;28(4):316-31. https://doi.org/10.1123/ijsnem.2018-0136

(87) Daubenmier JJ. The relationship of yoga, body awareness, and body responsiveness to self-objectification and disordered eating. Psychology of Women Quarterly. 2005 Jun;29(2):207-19. https://doi.org/10.1111/j.1471-6402.2005.00183.x

(88) Gray P, Murphy M, Gallagher A, Simpson EE. A qualitative investigation of physical activity compensation among older adults. British Journal of Health Psychology. 2018 Feb;23(1):208-24. https://doi.org/10.1111/bjhp.12282

(89) Peluso MA, De Andrade LH. Physical activity and mental health: the association between exercise and mood. Clinics. 2005 Feb 1;60(1):61-70. https://doi.org/10.1590/S1807-59322005000100012

EXTENDED PAPER

Extended Introduction

1.1 Historical Context of Disordered Eating

Disordered Eating (DE) is not yet a term recognised in the Diagnostic and Statistical Manual of Mental Disorders (DSM) but is a term that is used clinically and theoretically. It originates from eating disorder literature and serves to aid understanding of the full range of eating difficulties and related behaviours. Eating disorders and DE have been recognised since the 17th Century, when the first descriptions of anorexia were explained in a medical setting (Morton, 1694). It wasn't until the 21st century that bulimia symptoms and binge eating symptoms were first noted in patients, and eating disorder research began to expand, leading to eating disorders being recognised as psychological conditions (Gordon, 2017). Although, it is difficult to understand in detail the history of eating disorders and DE as there are fewer published papers on their history (Dolan et al, 1992; Gordon, 2017). One of the difficulties in researching DE has been the heterogeneity of diagnostic categories, which have long only served eating disorders. The categories include anorexia nervosa, bulimia nervosa, and atypical eating disorders (Dolan et al., 1992; Gordon et al., 2010). These categories represent the extremes in terms of DE behaviours and cognitions.

Terms related to DE can be used in a non-clinical way commonly referring to any fluctuation to what is deemed normal eating. DE as a clinical term refers to any abnormal patterns of eating from the mildest to the most severe. Whereas the term eating disorder represents the most severe only, where a diagnostic criterion can be applied and a diagnosis given (Yager et al., 2014).

1.2 Defining Disordered Eating

DE sits on a spectrum from engaging with diet behaviours, to clinical eating disorders. At present, there is no diagnostic criteria for DE (Pereira & Alvarenga 2007), this is because DE is currently understood to

encapsulate the full range of eating-related difficulties ranging from diets to clinical eating disorders (Yager et al., 2014). DE is characterised by behaviours which are restrictive, compulsive, or inflexible in nature (Macnine et al., 2020; Tanofsky & Yanovski, 2004). Other behaviours which may be present in a person with DE include fasting, binge eating, skipping meals, avoiding certain food groups, self-induced vomiting, laxative and/or diuretic misuse, steroid and creatine use, taking diet pills, and compulsive exercise (Yager et al., 2014).

As DE sits on a spectrum, it can be difficult to define when eating becomes "disordered" (Hawkins Elder, 2021). For this study, DE was self-reported by participants, it was conceptualised by the researcher as eating and related behaviours, such as exercise, which no longer serve the individual physically and mentally. This is influenced by Nielsen and Ward's (2020) embodied-enactive approach to mental health problems, which proposes that mental health problems develop when behaviours violate an individual's functional norms. This is specific to the individual's biology, psychology, and sociocultural context rather than being based on generalised statistical normalities (Nielsen & Ward, 2020).

To better understand DE, a Disordered Eating Attitude Scale has been developed (Alvarenga et al., 2010). This aims to measure DE attitudes, which the scale defines as abnormal beliefs, thoughts, feelings, and behaviours about food. The scale has been found to have acceptable convergent validity when correlated with the Eating Attitude Test (Garner et al., 1982) and was able to differentiate between bulimia and anorexia symptoms (Alvarenga et al., 2010).

1.3 Theoretical Models of Disordered Eating

Generally, it is agreed that the aetiology of DE is multifactorial (Striegal-Moore & Cachelin, 2001). Researchers typically work from a biopsychosocial framework when attempting to understand the factors that influence DE (Polivy et al., 2006).

1.3.1 Acceptance Model of Intuitive Eating

The acceptance model of intuitive eating (Avalos & Tylka, 2006) was developed alongside evidence that positive body image and intuitive eating (trust in and connection with one's internal hunger and satiety cues and eating in response to these cues) are important in the prevention of body dissatisfaction and DE (Tribole & Resche, 2020). Intuitive eating is thought to be innate, but the likelihood of a person continuing to engage in this form of eating is influenced by their environment. Body acceptance from others helps people to appreciate their own body, and resist adopting an observer's perspective of their body (Augustus-Horvath & Tylka, 2011). This is said to contribute to the person's ability to eat intuitively, while appreciating their own body and not wishing to influence their weight and shape by suppressing their hunger cues (Augustus-Horvath & Tylka, 2011). Therefore, when the reverse occurs and a person does not accept their body, they will be less likely to appreciate their body which in turn makes them more likely to take an observer's perspective, leading to more negative body comparisons which can lead to the development of body dissatisfaction and in turn DE (Fizsimmons-Craft et al., 2012).

There is a large body of support for the acceptance model of intuitive eating (Andrew et al., 2015; Oh et al., 2012). There is also evidence that this model can influence engagement with exercise, with exercise being motivated by intuitive functional reasons for fitness and health, as well as appearance (Tylka & Homan, 2015). In college students it was found that body acceptance contributed to functional and intuitive engagement with exercise, whereas body dissatisfaction contributed to exercising for aesthetic motivations, these differences were seen across men and women (Tylka & Homan, 2015). This study was the first to explore the acceptance model of intuitive eating with male and provided some support for validity of the model in males (Tylka & Homan, 2015). Most research has explored the model among adolescent and young women, and it is also only in recent years that the model has been tested

among non-white populations (Modica & DiLillo, 2023). Therefore, the model requires further exploration to aid our understanding of intuitive eating and how this may interact with the development of DE.

1.3.2 Cognitive Model of Bulimia Nervosa

The cognitive model of bulimia nervosa (Cooper & Fairburn, 2010) proposes that negative beliefs about the self are expressed as negative automatic thoughts which cause a person emotional distress (Pennesi & Wade, 2016). To manage this distress the person engages with bingeing and purging behaviours, as these provide a distraction from their negative automatic thoughts and associated emotional distress (Cooper & Fairburn, 2010). These experiences are generally associated with positive beliefs, such as bingeing will alleviate sadness, and simultaneous negative beliefs, such as overeating will make one fat (Pennesi & Wade, 2016). These conflicting beliefs cause a vicious cycle, whereby the person continues to binge and then purge to manage the distress caused by these beliefs.

In a cross-sectional analysis of the model, using DE and eating disorder patients, support was found for the suggestion that negative self-beliefs are associated with emotional distress, which are managed through engaging in binge eating (Bergin & Wade, 2012). However, the analysis did not find support for the link between emotional distress and purging behaviours (Bergin & Wade, 2012). Suggesting that the model needs further refinement to account for both bingeing and purging behaviours.

1.3.3 Cognitive-Interpersonal Maintenance Model of Anorexia Nervosa

The cognitive interpersonal maintenance model of anorexia nervosa (Schmidt & Treasure, 2006; Treasure & Schmidt, 2013) concerns itself with the maintenance factors of anorexia, including cognitive, interpersonal, and socio-emotional factors (Pennesi & Wade, 2016). The model suggests that there are predisposing factors including obsessive

compulsive features, perfectionism, and anxious avoidance which increase a person's vulnerability to anorexia (Schmidt & Treasure, 2006). These vulnerabilities also contribute to the maintenance of anorexia, as the individual begins to adopt pro-anorexia beliefs and behaviours, which place value on thinness for example (Schmidt & Treasure, 2006; Treasure & Schmidt, 2013). Such traits and anorexia symptomatology can lead to problems with interpersonal relationships, which in turn maintain the anorexia (Treasure & Schmidt, 2013). This model led to the development of a talking therapy for anorexia: Maudsley Model of Anorexia Nervosa (MANTRA) (Schmidt et al., 2014).

The model has continued to develop since it was first outlined, and further details have since been added about the long-term consequences of living with anorexia (Treasure et al., 2020). These include the reactions of others to the illness, including professionals, and the intense emotional component to these. It is hypothesised that such reactions and counter-reactions can cause the eating disorder to become further entrenched, making it even more difficult to treat (Treasure et al., 2020).

1.3.4 Functional Model of Emotional Avoidance in Anorexia Nervosa

The functional model of emotional avoidance in anorexia nervosa (Wildes et al., 2010) was developed following a large body of research demonstrating that emotional avoidance is central to both the development and maintenance of anorexia (Gale et al., 2006; NordbØ et al., 2006). This model proposes that anorexia symptomatology aids individuals in managing comorbid depression and anxiety symptoms, and the functional behaviours of anorexia are influenced by emotional avoidance (Wildes et al., 2010). Evaluations of the model among those with anorexia have found that levels of emotional avoidance in those with anorexia are comparable to or higher than those witnessed in other mental health conditions, and exceed non-clinical samples (Wildes et al., 2010).

Further support for the model comes from research exploring the role of the "emotional self" in anorexia (Oldershaw et al., 2019). It is proposed that those with anorexia have difficulties with emotional attunement, which lead to an overwhelming emotional experience. The anorexia emerges as a way of not only regulating these difficult emotions, but also providing a false sense of self (Oldershaw et al., 2019), which leads to a strong identity as an anorexic in these individuals. This creates a vicious cycle which is difficult to break, as it involves not only opening the individual up to the difficult emotional experience, but also shifting their sense of identity.

1.3.5 Interpersonal Model of Binge Eating

The interpersonal model of binge eating (Wilfley et al., 2002) developed from an integration of the restraint model (Ardovini et al., 1999) and the interpersonal vulnerability model of binge eating (Thomas et al., 2010). The model proposes that individuals engage in binge eating to manage emotional distress which has been triggered by difficulties with interpersonal functioning, low self-esteem, and negative affect (Wilfley et al., 2002). In an evaluation of the model, with a clinical sample of those who binge eat, it was found that those with higher levels of interpersonal difficulties demonstrated increased levels of negative affect, and greater negative affect was correlated with increased binge eating symptoms (Ivanova et al., 2015). However, as with much of the research into eating disorders, this study only included female participants, and therefore cannot provide support for this model in other genders.

A limitation of this this model is that it fails to address why these individuals do not engage in compensatory behaviours for their binge eating. Models of bulimia nervosa posit that binge eating occurs to manage emotional distress, as also seen in binge eating disorder, however in those with bulimia purging behaviours are also engaged in to manage concerns about the consequences of overeating (Cooper & Fairburn, 2010). Further exploration would be useful into whether those

who binge eat without engaging in purging behaviours experience the same negative beliefs about overeating or not. If these same concerns are experienced, it would also be helpful to understand why this population do not engage in the same compensatory behaviours.

1.3.6 Model of Disordered Eating

The model of DE (Neumark-Sztainer et al., 2003) developed to explain unhealthy weight-control behaviours seen in adolescents. This theory suggests that socio-environmental factors such as family and peer weight related norms influence personal factors including weight concerns, mental wellbeing, and attitudes toward nutrition. These beliefs lead to the development of unhealthy behaviours to manage a person's weight (Neumark-Sztainer et al., 2003). Preliminary support has been found for this model through the prevention programmes that have been based on its theory, however it has not yet been investigated by any independent research teams (Pennesi & Wade, 2016).

1.3.7 Transdiagnostic Maintenance Model of Eating Disorders

The transdiagnostic maintenance model of eating disorders is based on established cognitive behavioural theories of eating disorders (Fairburn, 2009; Fairburn et al., 2003). The model suggests that all forms of eating disorders share distinctive psychopathology, and individuals with eating disorders move between diagnostic categories over time (Fairburn et al., 2003). Several maintaining factors of eating disorder psychopathology are said to be present across the disorders: dietary restraint, mood intolerance, perfectionism, difficulties in interpersonal relationships, low self-esteem, and over evaluation of eating, weight, and shape (Fairburn, 2009). Although this theory concerns itself primarily with the maintenance factors associated across eating disorders, it is thought that the maintenance factors and triggers for the development of an eating disorder likely overlap (Fairburn, 2009; Fairburn et al., 2003). This model has led to the development of an intervention for eating disorders,

Cognitive Behavioural Therapy for Eating Disorders (CBT-E) (Fairburn, 2009). The positive results of CBT-E when it has been tested as an intervention across eating disorder presentations (Fairburn et al., 2009; Hoiles et al., 2012; Lampard et al., 2013) provide support for the transdiagnostic maintenance model of eating disorders.

1.3.8 Sociocultural Model of Disordered Eating

The sociocultural model of DE (Stice, 1994) suggests that DE is a result of internalising the increasing pressures, particularly among women in Western society, to achieve the thin ideal and meet cultural beauty trends (Sypeck et al., 2004). This pressure is said to come from the media as well as parents and friends (Tylka & Subich et al, 2004). For these sociocultural pressures to become risk factors for DE they need to be internalised, if they are not, it is unlikely they would lead to DE (Fitzsimmons-Craft, 2011). Individuals do not passively receive sociocultural pressures, they deliberately engage with idealized images (Herman & Polivy, 2004). It is therefore argued that sociocultural factors influence DE through socio-cognitive mechanisms (Corning et al., 2006).

Although the model suggests that sociocultural influences have a greater pressure for women, the model has also received support among men. A study of an adapted version of Stice's (1994) sociocultural model of DE, which included social comparisons, was explored among a sample of adolescent males and females (Halliwell & Harvey, 2006). Among both the male and female participants pressure to lose weight was associated with increased DE symptomatology, and body dissatisfaction. Social comparison was found to be most strongly correlated with body dissatisfaction among the participants which perceived themselves to be overweight (Halliwell & Harvey, 2006). The findings of this study suggest that the model is appropriate for understanding DE behaviours across males and females and suggests the utility of including social comparison in the model.

1.3.8.1 Social Comparison Theory

Social comparison theory proposes that humans are driven to assess their progress and social standing (Festinger, 1954). The original theory of social comparison (Festinger, 1954) suggests that humans are driven to make favourable comparisons, comparing themselves with those who are like them. However, research into DE has found that those with DE, in particular women, are more likely to compare themselves to unrealistic ideals, comparing themselves equally to friends and those in the media (Fitzsimmons-Craft, 2011; Strahan et al., 2006). One suggestion for this, is that these women are aware that they will be judged among society against the idealised thin images shown in the media not just against their peers (Strahan et al., 2006). Such upward comparisons against peers and idealised media images may lead to internalised sociocultural pressures which can then develop into body image concerns and DE (Fitzsimmons-Craft et al., 2012).

Whilst this theory has mainly been explored among women, there are increasing representations of idealised males across media channels. Therefore, it is not unlikely that these comparisons occur in males as well. Research by Halliwell and Harvey (2010), found social comparison to be the biggest determinant of body dissatisfaction across males and females (see section 1.3.8).

1.3.8.2 Objectification Theory

Objectification theory (Fredrickson & Roberts, 1997) suggests that the female body has been constructed as an object to be sexually looked upon (Spitzack, 1990). This sexualisation occurs in several ways, including through the male gaze, female media representation, and sexual violence (Frederickson & Roberts, 1997). As the female body exists in this sociocultural context, and women experience objectification, they can learn to view themselves through the lens of the observer and begin to internalise that they are objects to be looked at (Fredrickson & Roberts, 1997; Swim et al., 2001). Behaviourally this can manifest as body

checking, and hypersensitivity to how one's body is viewed by others (Moradi, 2011). This increased attention to their appearance, may again bring attention to comparisons between the self and the thin ideal, which can manifest as body image concerns and DE (Fizsimmons-Craft et al., 2012).

At present, the majority of objectification theory lacks sample diversity, and has mainly consisted of research using Caucasian women (Fitzsimmons-Craft et al., 2012). Although samples of women are becoming more diverse among objectification theory research, research on males would also be beneficial as they too can be objectified.

1.3.8.3 Tripartite Influence Model of Body Dissatisfaction and Disordered Eating

The tripartite influence model of body dissatisfaction and DE (Yamamiya et al., 2008) suggests that sociocultural influences from the media, parents, and peers, promote the internalisation of the thin ideal and social comparison, which leads to body dissatisfaction and DE (Pennesi & Wade, 2016). This model has been supported among adolescent and adult female samples (Keery et al., 2004; Van den Berg et al., 2002), and modified versions which include muscle enhancement behaviours have begun to receive support among adolescent and adult male samples (Tylka, 2011; Tylka & Andorka, 2012).

Recently, the tripartite influence model of body dissatisfaction and DE was tested amongst adolescent girls cross-culturally (participants from Australia, China, India, and Iran) (Kakar et al., 2023). The findings provided support for the model cross-culturally, particularly when modified to include specific culture-based influences. Results suggested that pressure from the media was most prominent in the Australian sample. Whereas those from Iran felt most pressure from family, and the Indian sample felt most pressure from family and peers. The Chinese sample reported the same level of pressure across media, family, and

peers. Across all the samples these pressures were associated with increased body dissatisfaction and DE (Kakar et al., 2023).

1.3.9 Critique of Existing Theories

It has been acknowledged that DE is best viewed through a biopsychosocial lens (Polivy et al., 2006). However, the presented theories tend not to focus on all three elements (biological, psychological, social) in unison. Moreover, the presented theories fail to account for the internal processes experienced by individuals with DE and how these may occur and influence behaviour in different social contexts. This is also reflected in the intervention landscape, treatments tend to be targeted at the biological elements: weight restoration, managing activity levels, and the use of medication, and psychological elements: talking therapies. Where treatments tend to lack is the social element, failing to consider the role of social comparison, and interpersonal relationships in the development and maintenance of DE. That is except for MANTRA (Schimidt et al., 2014), which considers all three elements, and works through each in its workbook. However, at present MANTRA has only been found to be effective in treating anorexia nervosa, and despite working to treat the three elements, is informed by the cognitive interpersonal maintenance model of anorexia nervosa (Schmidt & Treasure, 2006; Treasure & Schmidt, 2013) which focuses on only the psychological and social elements. Therefore, the biological component of MANTRA, which is mainly nutrition focused, lacks a strong biological theoretical basis.

Future theoretical development needs to account for all three elements and place equal importance on each, which will allow for the effective formulation of eating disorders and DE that account for the whole person (Johnstone & Dallos, 2013). There is also place for a socio-ecologically informed model which accounts for internal processes in social contexts, while also attending to broader layers of context such as the role of advertising, capitalism, and culture. Such advances in theory will allow for

better treatments which work to target the DE symptomatology in each of the three elements while taking into account current social context, providing a more individualised approach to treatment.

1.4 Psychological Interventions for Disordered Eating

There have been several advances in the prevention and treatment of DE, however gaps remain in the effectiveness of these interventions (Pennesi & Wade, 2016). A large majority of these approaches have been developed without theoretical input, and lack empirical support, knowledge is also lacking on which interventions work best for which people (Vall & Wade, 2015).

1.4.1 Intuitive Eating

There have been recent developments, following the acceptance model of intuitive eating (Avalos & Tylka, 2006), that have looked to create intuitive eating education programmes to promote a healthy relationship with food and reduce the risks of developing DE symptomatology. An intuitive eating approach encourages individuals to accept all foods without labelling them as "good" or "bad", instead focusing on huger and satiety cues to guide eating (Bacon et al., 2005).

An example of an intuitive eating programme is "Health at Every Size" (Bacon et al., 2005; Provencher et al., 2007). This programme focuses on body acceptance, eating behaviours, nutrition, activity, and social support. The initial focus is on self-acceptance and living a full life, regardless of weight and shape, with the goal of separating individuals' feelings of self-worth from being tied to their weight. The programme encourages individuals to let go of their restrictive eating behaviours and begin internally regulating their eating: individuals are taught skills to listen to their mind-body connection and recognise hunger and satiety cues. The nutrition aspect of the programme provides education on nutritional information, and the impact of food on mental wellbeing as well as physical health. The activity component supports individuals to

engage in exercise and physical activity, while overcoming barriers to access that have been found to be attitudes toward their bodies. Finally, support groups are encouraged to help individuals share their experiences and learn strategies for self-assertion. In an evaluation of this programme which compared it to a diet programme, it was found that participants of the Health at Every Size programme were able to maintain long-term behaviour change, when the diet programme participants did not (Bacon et al., 2005).

In a review of research on intuitive eating, it was found that there are consistent associations between intuitive eating and better mental health (Van Dyke & Drinkwater, 2014). There was also evidence to suggest that intuitive eating programmes supported weight loss in those of a high body mass index and had a positive impact on weight maintenance (Van Dyke & Drinkwater, 2014).

1.4.2 Cognitive-Based Self-Help for Bulimia

Cognitive-based self-help for bulimia (Cooper et al., 2004) is a manualised treatment approach that a person can complete alone or while working with a therapist. The manual includes psychoeducation on bulimia, motivation, orientation to the cognitive model, thought challenging, behavioural experiments, and changing maladaptive behaviours (Cooper et al., 2004).

There has been limited research into the effectiveness of this approach for those with bulimia (Pennesi & Wade, 2016). The evidence that does exist has found that guided self-help informed by cognitive techniques can offer a useful first-line intervention for bulimia (Pritchard et al., 2004).

1.4.3 Maudsley Model of Anorexia Nervosa Treatment for Adults

MANTRA (Schmidt et al., 2014) is one of the most widely used therapeutic interventions for anorexia nervosa in adults. MANTRA addresses thinking styles which are rigid and detailed focused, avoidant emotional

processing, positive beliefs about the usefulness of anorexia for the individual, and responses of family and friends to the illness (Schmidt et al., 2014).

MANTRA has received validation in both case series (Slater et al., 2015; Wade et al., 2011) and randomised control trials (Lose et al., 2014; Schmidt et al., 2013). To improve outcomes when using MANTRA, the developers of the model suggest the use of adjunctive strategies such as attention training protocols, and pharmacological interventions to support the aspects of brain function which are impaired in those with anorexia (Treasure & Schmidt, 2013). However, most of the research has studied adult women with anorexia, and therefore these findings do not generalise across the whole population of individuals with anorexia.

1.4.4 Dissonance-Based Eating Disorder Prevention Programme

The dissonance-based eating disorder prevention programme is regarded as the gold-standard in eating disorder prevention for bulimia symptoms for adolescent and adult women who experience body dissatisfaction (Becker et al., 2014; Stice et al., 2009). It is informed by Festinger's (1957) theory that holding cognitions which are inconsistent with one's beliefs creates emotional distress, which motivates people to change their behaviours and/or attitudes to reduce the inconsistency.

Festinger's (1957) theories about cognitive dissonance are used in this approach to target the internalisation of the thin-ideal, by asking participants in the intervention to argue against the ideal. This has been found to promote change in levels of body dissatisfaction, and partially reduce symptoms of bulimia (Stice et al., 2011).

1.4.5 Emotion Acceptance Behaviour Therapy

Emotion acceptance behaviour therapy (Wildes & Marcus, 2011; Wildes et al., 2014) was developed for adolescents and adults with anorexia. It is an outpatient intervention based on anorexia specific symptoms, with an emphasis on emotional avoidance (Wildes et al., 2014). The intervention

combines behavioural interventions to manage anorexia with evidence-based strategies to increase emotion awareness, and decrease emotion avoidance (Wildes et al., 2014).

Emotion acceptance behaviour therapy has received preliminary support for both adolescents and adults, although only for older adolescents (Wildes et al., 2014; Wildes & Marcus, 2011). Therefore, more research into the effectiveness of this intervention is warranted.

1.4.6 Interpersonal Psychotherapy for Eating Disorders

Interpersonal psychotherapy for eating disorders was informed by interpersonal psychotherapy, which has been found to be beneficial in the treatment of bulimia (Fairburn et al., 1993) and effective in group settings for the treatment of binge eating disorder (Wilfley et al., 2002). The intervention targets interpersonal functioning including grief, interpersonal role disputes, interpersonal deficits, and role transitions, based on the theory that difficulties with social functioning create low self-esteem and negative affect, which are managed by binge eating (Pennesi & Wade, 2016).

In those with binge eating disorder interpersonal psychotherapy for eating disorders has been found to be more effective than behaviourally based weight loss interventions, and cognitive behavioural therapy (Wilson et al., 2010). However, its effectiveness in treating other eating disorders is yet to be explored.

1.4.7 Cognitive Behavioural Therapy for Eating Disorders

Cooper and Fairburn's (1993) "core psychopathology" of eating disorders lead to the development of an enhanced form of cognitive behavioural therapy for eating disorders (CBT-E; Fairburn, 2008). CBT-E works to address the core maintenance factors which are most relevant to the individual, based on their psychological formulation of their difficulties (Fairburn, 2008).

CBT-E has been extensively studied (Fairburn et al., 2009, Hoiles et al., 2012; Lampard et al., 2013) and is the first line treatment for individuals with a Body Mass Index (BMI) of more than 17.5 (Fairburn et al., 2015; Poulsen et al., 2014). There is also evidence to support the use of CBT-E in the treatment of anorexia in those with a BMI lower than 17.5 (Dalle Grave et al., 2014; Fairburn et al., 2013), supporting its theoretical grounding in the transdiagnostic maintenance model of eating disorders (Fairburn, 2008; Fairburn et al., 2003).

1.5 Exercise and Compulsive Exercise

The National Health Service (NHS) recommends that adults between the ages of 19 and 64 years should do some form of physical activity every day. It also suggests adults engage in at least 150 minutes of moderate intensity activity, or 75 minutes of vigorous activity, spread over four to five days throughout the week (NHS, 2024). The NHS proposes that doing these levels of exercise weekly can reduce risks of major illnesses including heart disease, stroke, and cancer, as well as lowering the early risk of death by 30% (NHS, 2024). These benefits as well as those on well-being and quality of life have been well documented (Deslandes et al., 2009; Herbert et al., 2020).

In the DE clinical literature, the definition of exercise and related terms are inconsistent, and there have been difficulties in ascertaining a consensus of what constitutes problematic exercise (Shroff et al., 2006). Several terms have been used interchangeably: “exercise addiction”, “compulsive exercise”, “exercise dependence”, and “excessive exercise” (Roffe, 2017). The differences tend to lie in whether the definitions are quantitative or qualitative (Adkins & Keel, 2005). “Excessive exercise” is typically a quantitative definition which considers the frequency, duration, and intensity of the exercise (Davis & Fox, 1993), although a consensus about what would be considered too much exercise is currently lacking (Meyer & Taranis, 2011). “Compulsive exercise” is typically a qualitative definition, in which exercise is defined by its compulsivity in which

individual's experience a drive to exercise in a rigid way, feeling unable to stop their engagement with exercise (Taranis et al., 2011).

"Compulsive exercise" is the more theoretically driven definition (Meyer & Taranis, 2011), and eating disordered attitudes and behaviours associated with "compulsive exercise" have been found in eating disorder and DE populations (Adkins & Keel, 2005; Boyd et al., 2007). Therefore, this is the definition that has been used throughout this study.

1.5.1 Disordered Eating and Exercise

Since the first descriptions of eating disorders, it has been recognised that an excessive drive to exercise is one of the prominent symptoms (Gull, 1874). It is estimated that prevalence rates of compulsive exercise in those with eating disorders is between 16.7% to 85.3% in adolescents (Fietz et al., 2014) and 31.9% to 80% in adults (Shroff et al., 2006). It is believed that those with DE engage with compulsive exercise for two reasons: to regulate emotional affect (Meyer & Taranis, 2011) and to increase expenditure of calories in the pursuit of thinness (Dalle Grave et al., 2008). Exercise can be one of the first symptoms to present in DE (Davis & Fox, 1993) and can also be one of the last to resolve, research also suggests that compulsive exercise can reduce relapse time and extend inpatient admissions in clinical samples (Rigaud et al., 2011; Solenberger, 2001).

1.6 Cognitive Behavioural Maintenance Model of Compulsive Exercise

The Cognitive behavioural maintenance model of compulsive exercise (Meyer et al., 2011) proposes four interlinked processes which maintain compulsive exercise: eating pathology, psychological dependence on mood regulation, compulsivity, and perfectionism and behavioural rigidity.

1.6.1 Eating Pathology

Among DE samples, higher levels of compulsive exercise have been significantly associated with higher levels of eating disordered symptoms (Shroff et al., 2006). Even among non-disordered eating samples, compulsive exercise has been correlated with eating disorder psychopathology scores on clinical measures (Elbourne & Chen, 2007). One feature of eating disorder pathology which is prevalent among those with compulsive exercise is "debting" behaviour, which is seen in DE as a reinforcing behaviour where food and exercise are treated as a monetised system (Meyer et al., 2011). Overeating is seen as bad, and to work off this "debt" the individual must engage in more exercise. Similarly, not exercising as much as the individual believes they should, results in undereating or potentially engaging in other purging behaviours to avoid weight gain.

Behaviours such as this are not uncommon in the non-DE population, it can be seen as normal, and often encouraged to engage in "debting" behaviours, this is the basis of many diets. Exercise classes often encourage this narrative as well, with instructors telling the participants they have "earnt" their food after engaging in the class. This can make it difficult to discriminate between compulsive exercise, and "normal" behaviours, which is one reason that DE sits on a spectrum from engaging with diet behaviour through to clinical eating disorders. The distinction occurs based on whether weight and shape concerns are the central features of the compulsive exercise, without these concerns compulsive exercise is not seen as clinically significant (Mond et al., 2004).

1.6.2 Psychological Dependence on Mood Regulation

Links between affect regulation and eating disorders have long been established and have been found in those with restrictive and bulimic behaviours (Fairburn et al., 2003). The same regulatory effects have been found when engaging in compulsive exercise behaviours (Lawson et al.,

2007). Mood regulation has been found to be one of the biggest motivators for engaging in exercise, in both clinical and non-clinical samples (Meyer et al., 2011).

The impact of exercise on a person's mood can reinforce the exercise behaviour. Engagement with exercise can be positively reinforced by the improved mood people feel after exercising due to the release of endorphins and dopamine (Leuenberger, 2006). It can also be negatively reinforced through the avoidance of withdrawal, the individual engages with exercise to avoid the potentially negative effects on their mood if they do not exercise (Geller et al., 2000). There is some evidence to suggest that this psychological dependence on exercise is shown only among the ED population. Such that it can be used to discriminate between those with EDs and those without (Boyd et al., 2007).

1.6.3 Compulsivity

Compulsivity in this context refers to the urge to engage in exercise to relieve anxiety from the perceived negative consequences of reducing or stopping exercise (Meyer et al., 2011). These concerns could be related to the perceived negative consequences of not exercising such as gaining weight, or the feelings of guilt. Even the fear of guilt has been found to be a maintaining factor in someone exercising with DE (Mancini & Gangemi, 2006). It has been suggested that the withdrawal symptoms from exercising, such as anxiety, depression, and guilt, can cause the individual to become even more fearful of changing their exercise behaviours, leading to further compulsive exercise (Meyer et al., 2011).

Links have also been found between low body weight, frequently seen among those with DE, and compulsivity (Meyer et al., 2011). Starvation has been found to facilitate compulsive exercise, which involuntarily becomes stereotyped, ritualised, and excessive because of the effects of starvation on the brain (Crisp, 1967). This is further supported by the evidence than serotonin dysregulation is a consequence

of malnutrition, which is also implicated in the development of compulsive behaviours (Kaye et al., 1993).

1.6.4 Perfectionism and Behavioural Rigidity

Perfectionism is highly associated with both DE and compulsive exercise (Flett & Hewitt, 2005; Halmi et al., 2000), more than any other obsessive-compulsive personality traits associated with DE (Halmi, 2004). Moreover, those with anorexia who engage in compulsive exercise show higher levels of perfectionism than those with anorexia who do not engage in exercise (Davis & Claridge, 1998). Higher levels of perfectionism have also been found to be associated with poorer treatment outcomes for those with compulsive exercise, further supporting perfectionism as a maintaining factor of compulsive exercise (Long, 1995).

Behavioural rigidity is another key feature of compulsive exercise, with exercises frequently being completed in a stereotyped and repetitive manner (Cosh et al., 2023). A cluster analysis of personality pathology in eating disorder patients found that nearly half were clustered by behavioural rigidity, further supporting this as a feature of compulsive exercise (Goldner et al., 1999). In those with compulsive exercise, rigidity has been associated with emotional consequences of not being able to meet personal standards (Meyer et al., 2011). Suggesting that behavioural rigidity is also associated with perfectionism, and the two interlink in maintaining compulsive exercise among those with DE.

1.7 Interventions for Compulsive Exercise

There is a lack of consensus over how to treat compulsive exercise (Martenstyn et al., 2022), and no current clinical guidelines exist (Hallward et al., 2022). In a systematic review of treatments for compulsive exercise Martenstyn and colleagues (2022) found limited research into the field, the outcome of their review concluded that multicomponent interventions were most effective in reducing compulsive

exercise in those with eating disorders. Multicomponent interventions can be a combination of psychoeducation, virtual reality, CBT, structured exercise, and dietetics (Martenstyn et al., 2022). Similar results were found in another systematic literature review by Hallward and colleagues (2022). Their study concluded that interventions focused on psychoeducation on exercise, which also incorporated structured exercise, can reduce compulsive exercise behaviours in those with eating disorders and DE (Hallward et al., 2022).

The one programme currently used for the treatment of compulsive exercise is the "compuLsive Exercise Activity theraPy" (LEAP) programme (Taranis et al., 2011). LEAP is based on CBT and aims to provide participants with the knowledge and skills to feel in control of their exercise behaviours, and to support them to engage with goal, age, and health appropriate exercise (Hay et al., 2018; Taranis et al., 2011). It is delivered in one individual session and eight group sessions and is often offered alongside CBT-E (Fairburn, 2008 Monell et al., 2021).

At present LEAP has been evaluated in two pilot studies and one randomised control trial (Monell et al., 2021). These studies found that LEAP is effective in reducing eating disorder pathology and improving attitudes towards exercise in those with anorexia (Hay et al., 2018). However, it's effectiveness has yet to be studied across the full range of DE and eating disorder pathologies despite evidence that compulsive exercise is a transdiagnostic feature of DE (Harris et al., 2024; Monell et al., 2021).

1.7.1 Exercise in Recovery from Disordered Eating

There is limited research into exercise in recovery from DE, as well as exercise in treatment for DE. Of those treatment programmes that have allowed those in treatment to engage in controlled exercise, some positive effects have been found (Chantler et al., 2006). These positive effects included improved quality of life, wellbeing, and increased treatment compliance whilst not negatively impacting on weight restoration (Moola

et al., 2013). There is also a small body of evidence that supported controlled exercise in treatment, which found it can reduce body image concerns, and increase social exercise (Duesund & Skarderud, 2003).

1.8 The Mind and Body

1.8.1 The Mind

The Oxford English Dictionary defines the mind as the element of a person that allows them to be aware of the world, their experiences, to think, and to feel, the faculty of consciousness and thought. This research focused strongly on mind-body connection; therefore, it is important to define '*mind*' for the purpose of this research. Throughout this study the mind was understood through Siegal's (2019) definition, which poses that the mind is made up of four interlinked facets: subjective experiences, consciousness, information processing, and self-organisation.

1.8.2 The Body

The Oxford English Dictionary defines the body as the complete physical form of a person, including the parts, organs, and tissues that contribute to the whole material organism. The brain can be defined as part of the body, although for many, there is substance dualism in which there are brain elements, and mind elements (Reiner & Nagel, 2017). In this study the brain was an organ, which is responsible for allowing individuals to experience subjective experiences, consciousness, information processing, and self-organisation, all of which form the mind (a non-physical form). As such, the brain forms part of the physical body, while also allowing the mind to exist through neuronal activity (Reiner & Nagel, 2017).

This study was also concerned with emotions felt in the body, emotions can be physically felt in the body and somatosensory feedback has been suggested to trigger conscious emotional experiences within the mind (Nummenmaa et al., 2013). Emotions could be argued to be an important component in connecting the mind and the body, as they are

experienced within both, triggering physical sensations as well as conscious thoughts.

1.8.3 Mind-Body Connection

The mind and body were once viewed as dichotomous, now they are seen as interconnected parts, with the mind being able to influence the physical body and vice versa (Littrell, 2008). Mind-body connection is seen across the lifespan, beginning with babies kicking and screaming to signal their frustration, to adults taking deep breaths to calm themselves down when they are feeling anxious (Acolin, 2016). Yet, it has been acknowledged that in Western societies mind-body connection has largely been ignored in treatments for both physical and mental health problems, with the mind and body continuing to be viewed as dichotomous (McCabe, 2008). This has contributed to few clinical definitions of mind-body connection, but a variety of terms being used to describe the same phenomenon, including embodiment, mind/body connection, and body awareness. Broadly mind-body connection is understood as the link between an individual's thoughts, attitudes, behaviours, and health (Littrell, 2008).

Mind-body connection has been explored in cognitive and behavioural neurosciences, and is under the umbrella of embodiment research, which has begun to spread into the fields of psychology and physical health (Acolin, 2016). Until recently mind-body connection had largely been ignored in Western cultures, with doctors focusing on the physical body and psychologists focusing on the mind (Acolin, 2016). Research is continuing to emerge demonstrating the links between body movements and mental attitudes (Koch et al., 2011).

Psychology is becoming increasingly interested in how a person's thoughts, feelings, and behaviours are rooted in bodily interactions with the environment (Meier et al., 2012). Within psychology mind-body connection is also referred to as embodiment. Clinically, within the field of psychology, experiences of mind-body connection have been explored in

complementary and alternative medicines (Park, 2013). Emerging evidence has suggested that integrating mind-body connection-based interventions into treatment can support a broader perspective on stress and coping mechanisms (Park, 2013).

1.8.4 Mind-Body Connection and Disordered Eating

Mind-body connection is an important area of study in DE, due to the unique symptomatology of DE as a mental health problem which also have a physical impact on the body (Myszko et al., 2023). It has been clinically recognised that in those with DE and eating disorders, a separation of the perceived self from the body occurs (Cook-Cottone, 2020). This separation leads to, or allows the body to become the enemy, something that can be controlled and managed by the individual, or rather by the DE cognitions and behaviours the individual is experiencing (Cook-Cottone, 2020). Research suggests that those with DE exhibit a combination of distorted thinking, difficulties with emotion regulation, and difficulties with interpersonal relationships which can all be mediated through mind-body connection, by creating a disconnect between the body's physical needs and the mind's beliefs about those needs (Marsh, 2015). For those with DE their mind-body connection can become self-destructive, or when avoided, a form of self-abandonment (Cook-Cottone, 2020).

Based on this knowledge, in treatment for DE and eating disorders it is therefore necessary to work to establish a positive mind-body connection, and embodiment practices which move beyond a relief from symptoms (Cook-Cottone, 2020). A positive mind-body connection involves attunement to internal needs, a sense of purpose and meaning, and an experience of the self in the world (Cook-Cottone, 2015).

1.8.5 Mind-Body Connection, Exercise, and Disordered Eating

Mind-body specific exercises, distinct from meditation and related mindfulness exercises, have become popular among health, fitness, and

rehabilitation (Ives & Sosnoff, 2000). Such exercises work to "unify" the mind and body through motor coordination and somatosensory functioning (Ives & Sosnoff, 2000). Existing mind-body exercises included Body-Mind Centering, Authentic Movement, 5Rhythms, Focusing Techniques, and Body-Mind Psychotherapy (Shapiro, 2020).

Exercises do not have to be specifically defined as mind-body exercise to support mind-body connection. Several exercises have been found to support mind-body connection, initially these were only mindful based exercises such as yoga and qigong, but dance and movement therapies are now also considered to support mind-body connection (Shapiro, 2020). Engaging with such practices which focus on the embodied experience of the movements, help to promote understanding of the lived experience of physical expression, thoughts, emotional experiences, and overall well-being (Shapiro, 2020).

Despite the evidence that both mind-body exercises and other forms of exercise can improve the embodied experience, there is no current protocol for exercise interventions in the treatment of DE (Calogero & Pedrotty, 2004). However, exercise interventions for DE are occurring and several literature reviews have concluded that exercise for DE is safe providing the patients' nutritional needs are met (Hausenblas et al., 2008; Moola et al., 2013; Zunker et al., 2011). In their review of exercise protocols used in eating disorder and DE treatment Calogero and Pedrotty (2004) found that despite the benefits of including exercise in treatment, such treatments tended to neglect the mind-body connection. With evidence suggesting that exercise which promotes mind-body connection can increase individual's awareness of their embodied experience, promote emotion regulation and understanding of physical expression, exercise with a focus on mind-body connection could be useful for those in recovery from DE who experience difficulties in these areas (Bardone-Cone et al., 2018; Mond & Calogero, 2009).

As well as the benefits already evidenced for mind-body connection through engaging with exercise, for those with DE it could also aid their

relationships with exercise by placing greater importance on what the body feels capable of doing, and how the exercise makes them feel physically and mentally (Gavin & McBrearty, 2006). Therefore, Calogero and Pedrotty (2004) recommend exercise that supports mind-body connection for those in recovery from DE, to foster a healthy relationship with exercise. Variety, flexibility, and enjoyment are three key factors suggested by Calogero and Pedrotty (2007) to help achieve a healthy relationship with exercise. Others have suggested that in recovery exercise ought to be mindful, embodied, and non-competitive (Hockin-Boyers & Warin, 2021), however, an appropriate amount, regularity, and intensity for those in recovery from DE and eating disorders has not been agreed upon clinically or theoretically. The small body of research to date on the use of exercise in recovery from DE has explored participation in yoga and found this to be beneficial in the prevention and treatment of DE. It has been suggested that this could be due to the focus on mind-body connection during yoga (Flaherty, 2014; Douglass, 2009; Wyer, 2001), which may support individuals in understanding more about the needs of their body including when to exercise, when to rest, and how this may influence their mood.

1.9 Extended Rationale

Whilst research is emerging on the role exercise can play in supporting recovery from DE, individuals' experiences of their relationship with exercise in recovery are yet to be explored. Bardone-Cone and colleagues (2016) investigated the relationship with exercise in those with an active ED, in recovery from an ED, and fully recovered from an ED. They found that the psychological aspects of exercise were most consistent in distinguishing individuals who have recovered from those with an active ED, however behavioural aspects of exercise were poor predictors. Behavioural differences were found in those in their partially recovered group, with this group exercising more intensely than those defined as recovered or with an active ED. Due to their subclinical symptoms this

group would likely be defined as having DE. This is reflected by Bardone-Cone and colleagues' (2016) suggestion that although these individuals did not meet the diagnostic criteria for an ED, they still struggled with ED thinking and may have relied more on socially acceptable behaviours to manage their ED thoughts, hence they exercised more intensely. This highlights the need to explore the relationship with exercise with individuals who have struggled with DE. To build on their research findings Bardone-Cone and colleagues (2016) suggest that not only would it be beneficial to focus more on those with DE they also propose a further exploration of the role of mind-body connection and individuals' relationship with exercise among the DE population.

Therefore, this study aimed to increase understanding of individuals' lived experience of their relationship with exercise and mind-body connection in recovery from DE. Using qualitative research methods will allow the voice of this population to be heard and themes developed to support this understanding. Not only can this increase theoretical understanding of these individuals' recovery experience, but it also has the potential to guide clinical recommendations for care of those with DE.

Extended Methodology

2.1 Epistemological Position

This study is grounded in the epistemological position of critical realism. Critical realism uses components of both positivism and constructionism whilst resolving the quandaries of the two (Patel & Pilgrim, 2018), to provide a detailed account of ontology and epistemology (Brown et al., 2002). Through critical realism the world is treated as theory-laden but not theory-determined (Fletcher, 2017), it acknowledges that there is a real social world that we can attempt to understand, but even with that understanding some knowledge will be closer to reality than others (Bhaskar et al., 2002; Fletcher, 2017). Critical realism assumes ontological realism, whilst acknowledging epistemic relativism; our

measurements are biased, and our understanding exploratory and influenced by context (Ponterotto, 2005). Critical realism also highlights judgmental rationalism as a central theory within its position. This assumes that multiple perspectives should be pursued, compared, and evaluated, to reach a consensus of the "truth" (Barker et al., 2002). As a result, a critical realist position lends itself to qualitative research that seeks to identify and explore tentative causal explanations of unobservable phenomena (Lund, 2005).

When adopting this epistemological position in qualitative research, it is accepted that the aim of the research is to develop the best explanation of reality the participants find themselves in, through engaging with existing theories about their reality (Carter & New, 2005) whilst allowing for the development of new information and understanding (Fletcher, 2017). For these reasons, critical realism is compatible with inductive deductive thematic analysis. In this study, the critical realist position and compatible methodology allows for the development of a (tentative) understanding of the experiences and relationships those in recovery from DE have with their mind-body connection, and exercise.

2.2 Rationale for Qualitative Methodology

Qualitative methodologies are useful and appropriate for exploratory research that seeks to understand experiences of a particular phenomenon, as it deals with and is interested in creating meaning (Braun & Clarke, 2013). Qualitative research aims to record experiences of real life, and the messiness of it, whilst containing it within an organisational framework, and then interpreting this in some way (Braun & Clarke, 2013). As this interpretation is led by the researcher, unlike quantitative approaches which are grounded in positivist or post-positivist epistemologies, qualitative approaches acknowledge and appreciate the subjectivity of the researcher (Braun & Clarke, 2021). This study was interested in individuals' nuanced experiences, therefore a quantitative approach which would have sought to identify relationships between

variables and understand cause and effect would not have been appropriate. The research aims of this study lend themselves to a qualitative approach, allowing for the creation of knowledge situated in the context of the individuals' experiences and the meaning that is made of this by the participants and the researcher (Braun & Clarke, 2021).

2.3 Selecting a Qualitative Methodology

There is considerable overlap in what different qualitative analytic methods and methodologies can achieve (Braun & Clarke, 2021). Some methodologies are theoretically informed frameworks for research, including grounded theory, interpretive phenomenological analysis, and discourse analysis (Braun & Clarke, 2021). Others are theoretically independent techniques, in which theory is determined separately, such as thematic analysis (Braun & Clarke, 2021). Due to the overlap between methodologies, it is often the case that more than one could fit the research aims, and therefore selection is typically driven by conceptual or pragmatic reasons, whilst considering the researcher's epistemological position (Levitt et al., 2017). Therefore, the choice for this study was driven by both the research aims and the researcher's critical realist epistemology.

2.3.1 Grounded Theory

Grounded theory provides the researcher with a structured approach to analysing data, with the aim of developing theory from the data (Thornberg et al., 2014). There are several approaches to grounded theory, depending on the epistemological position (Thornberg et al., 2014), it lends itself to contextualism (Charmaz, 2014), constructionism (Madill et al., 2000), and positivism (Glaser, 1992). When broadly applied, grounded theory constructs theory by conducting interviews, analysing initial data, and then changing the interview schedule to explore prevalent codes (Sbaraini et al., 2011). Grounded theory is wholly an inductive approach, as the researcher remains independent from the

literature (Bryant & Charmaz, 2007), unlike reflexive thematic analysis that can be applied with a mixed inductive deductive approach. It is debated whether a researcher can ever remain independent from the theoretical literature, even when the researcher does not explicitly code the data deductively (Charmaz, 2014).

In the context of this study, grounded theory was not appropriate, because of the researcher's clinical and research background, they had already reviewed the wider literature extensively. Therefore, the researcher could not remain independent from the data. Moreover, the study did not aim to generate theory from the data, instead it aimed to explore individuals' experiences through an inductive deductive approach.

2.3.2 Interpretative Phenomenological Analysis

Interpretative phenomenological analysis (IPA) is concerned with the examination of individuals' lived experience (Eatough & Smith, 2017), and the meanings that individuals give to their experiences (Smith, 2011). IPA accepts a phenomenological commitment to examine a topic in its own terms, to do so it involves an interpretive process from both the participant and the researcher (Eatough & Smith, 2017). Due to the concern with detailed examination of a particular topic, IPA firstly provides in-depth accounts of each case, before looking for patterns of convergence and divergence across the cases (Eatough & Smith, 2017).

IPA is suited to the aims of this study, exploring experience, and is also mostly consistent with the researcher's epistemological position of critical realism. However, it lacks the theoretical flexibility that reflexive thematic analysis offers (Braun & Clarke, 2021). IPA has also been criticised for ignoring the influence of socio-cultural factors during analysis (Fox et el., 2009), and thus does not allow for more in-depth interpretation from the wider social and cultural context. Due to this, IPA is not entirely consistent with the critical realist epistemology. Furthermore, IPA is designed for research involving small homogenous groups, typically around four – six participants (Braun & Clarke, 2013).

Whereas the current study sought to provide a broader understanding of relationships with mind-body connection and exercise of those in recovery from DE.

2.3.3 Discourse Analysis

Discourse analysis is a method of studying and analysing use of language (Hodge, 2017), it assumes that the function of language is to construct reality (Willig, 2016) this makes it not only a qualitative method, but a school of thought. When using discourse analysis researchers do not use structured methods to allow coding, such as in reflexive thematic analysis, rather they immediately look for broad themes and functions of language (Hodge, 2017). Due to this discourse analysis is suited to naturalistic and interactive data sets, and it is not always appropriate for research that is interested in the understanding of individuals' experiences (Potter & Hepburn, 2005). This makes it unsuitable for the current study, which obtained its data through semi-structured interviews and is interested in the experiences of relationships with exercise and mind-body connection in recovery from DE, rather than attempting to understand how these experiences and relationships were constructed using language. Moreover, as discourse analysis is concerned with how language is used to construct reality it is grounded in social constructionism (Braun & Clarke, 2013), which is not consistent with the researcher's epistemological position of critical realism.

2.3.4 Reflexive Thematic Analysis

Thematic analysis is a method of developing, analysing, and interpreting patterns across a dataset (Braun & Clarke, 2022), there are many different varieties and ways of doing thematic analysis. This study was concerned with reflexive thematic analysis, reflexive thematic analysis involves the critical reflection of the researcher's own role in the research, as well as their research practice and process (Braun & Clarke, 2022). This approach fully embeds this method in the values of qualitative

paradigm, informing research practice, giving the concepts and processes their logic and validity (Braun & Clarke, 2022). Being a method rather than a methodology, reflexive thematic analysis can be used broadly with both experiential and critical analytic orientations and is suited to researchers with critical realism or constructionism epistemological positions (Braun & Clarke, 2013).

Reflexive thematic analysis is concerned with interpreting patterns of meaning and can be used to answer a broad range of research questions (Braun & Clarke, 2019). These patterns of meaning are labelled as themes, which can be developed inductively or deductively (Braun & Clarke, 2013). An inductive approach is data-driven and allows the researcher to be guided by the data, whereas a deductive approach is guided by the wider theoretical knowledge (Braun & Clarke, 2021). A mixed inductive deductive approach can also be taken, which is a strength of reflexive thematic analysis as it allows for data to be analysed in the context of existing theory and understanding (Braun & Clarke, 2013).

Not only can reflexive thematic analysis be both inductive and deductive, but it is also able to be coded at both the semantic and latent level (Braun & Clarke, 2013). When using semantic coding the researcher views the focus of meaning at the surface level, considering what is explicitly being said. Whilst when using latent coding the researcher explores meaning at the implicit level, attempting to interpret the underlying meaning behind what is being said (Braun & Clarke, 2021). By using both levels of coding reflexive thematic analysis is able to increase its interpretation of the data, rather than remaining at the descriptive level which thematic analysis has received criticism for (Braun & Clarke, 2013).

This study was the first to explore individuals' experiences of their relationship with exercise and mind-body connection in recovery from DE. Therefore, this approach allowed for novel insights to be developed from the data whilst holding in mind relevant theory which was used to inform the researcher's interpretations. Moreover, this method is coherent with

the researcher's epistemological position of critical realism. Thus, it was deemed most appropriate for this study.

2.4 Study Design

2.4.1 Semi-structured Interviews

To collect data semi-structured interviews were conducted, a method that is compatible with reflexive thematic analysis (Braun & Clarke, 2006, 2019). There are other data collection methods compatible with reflexive thematic analysis, such as focus groups, however, semi-structured interviews were deemed most appropriate for the research aims. The research is concerned with a sensitive topic, DE, and it was acknowledged that it may be difficult for participants to share their experiences of this in a group setting. Moreover, semi-structured interviews allow the researcher to explore participants' experiences, and their own understanding of the research topic, whilst also allowing participants to discuss potentially unexpected topics which are meaningful to them and the research (Braun & Clarke, 2022).

The interview schedule (see Appendix F) was made up of planned open-ended questions related to the research aims. These were informed by theory and clinical knowledge including consultation with experts by experience from First Steps ED and reviewing clinical measures: Scale of Body Connection (Price & Thompson, 2007) and the Compulsive Exercise Test (Taranis et al., 2011). Using open-ended questions also allowed opportunities for novel insights relevant to the research aims (Braun & Clarke, 2021). Using a semi-structured approach, the researcher was able to check clarity of participant responses, and their understanding of these responses, as well as ask follow-up questions to gain greater insight. A semi-structured approach also allowed participants the opportunity to use their own spontaneous language, and express their feelings (Denzin & Lincoln, 2006).

Interviews were conducted remotely via Microsoft Teams, which allowed the researcher to reach more participants as neither the

researcher nor participants were constrained by location and travel. The aim of this was to allow the researcher to capture experiences across the UK. At present face to face interviews are considered best practice, however there is increasing evidence supporting the use of online video platforms utilised for interviews (Gray et al., 2020). Online communication via video platforms has increased since the COVID-19 pandemic, something else the researcher considered while planning the research. Although there were no restrictions in place during the time that data were collected, COVID-19 outbreaks were still occurring in the NHS Trust where the researcher was working. Therefore, conducting online interviews was also thought to be useful in reducing the risk of the spread of infection.

A total of 14 semi-structured interviews were conducted, all via Microsoft Teams. Participants each completed one interview, the interviews lasted between 25 – 59 minutes.

2.4.2 Inclusion and Exclusion Criteria

Participants were screened against the inclusion criteria during initial communications with the researcher, prior to the participant being sent the participant information sheet and consent form. The inclusion criteria stated participants must be:

- Aged 18 years or older and able to provide informed consent.
- Be able to speak and understand English. *Justification: Translator services were not available to the researcher due to financial constraints. Language barriers could have resulted in the participants and researcher misinterpreting information during the interviews, which would impact the quality of the data.*
- Be in recovery from DE (self-reported). *Justification: Self-reported recovery was accepted, as those with DE may not have received a formal diagnosis or accessed treatment, nor is there a clinical criterion for recovery across this population.*

- Have access to the internet. *Justification: Interviews were conducted via Microsoft Teams, which requires an internet connection.*
- Exclusion criteria: Currently receiving treatment for DE. *Justification: Participants could have been in different stages of treatment, and therefore may not have entered recovery. Moreover, the sensitive nature of the research may have caused distress to the participants which could interfere with their ability to engage in treatment.*

The broad inclusion criterion aimed to capture a range of participants to reflect the heterogeneity of individuals in recovery from DE. Maximum heterogeneity is considered best practice in qualitative research (Fassinger, 2005) with the aim of allowing the researcher to gain a diversity of perspectives (Braun & Clarke, 2013).

2.4.3 Recruitment Procedure

The study was advertised online via social media platforms (Facebook, Instagram) of known eating disorder and DE support services (First Steps ED, Female Athlete Triad Awareness) with permissions for the advert (see Appendix E) to be shared. The advert was shared on these platforms to ensure it reached the target audience. The advert included the researcher's email address to allow potential participants to ask any questions ahead of agreeing to participate, and for the inclusion criteria to be discussed.

2.4.4 Sample Size

There are no standardised sample sizes for qualitative research, and ranges have been seen of between two and 400 participants (Fugard & Potts, 2015). Typically, due to the nature of qualitative research sample sizes are smaller than those seen in quantitative research studies. It is accepted that the sample size ought to be however many participants are

enough to answer the research aims, and draw conclusions from the data (Sandelowski, 1995).

Previously, reflexive thematic analysis supported the concept of data saturation, the process of continuing to recruit participants until new themes no longer emerged from the data (Braun & Clarke, 2021). Data saturation has been viewed as information redundancy, which provides a fixed point for ending recruitment and data collection (Dey, 1999), which arose from grounded theorists' statements about repetition and redundancy (Low, 2019). A suggested alternative to data saturation in qualitative research is theoretical sufficiency, which believes that data collection can end once the researcher has a sufficient understanding to build a theory and develop understanding (Dey, 1999; Nelson, 2017).

Data saturation has been closely linked with thematic analysis and has been suggested to be easily achieved using this method, however the process of understanding data saturation has not always been applied consistently (Braun & Clarke, 2021). Generally, the application of data saturation in thematic analysis has relied on an understanding of codes and themes which exist before the analysis and reside in the data, rather than codes and themes being the product of data analysis (Braun & Clarke, 2019). In reflexive thematic analysis, codes are never fixed and can continue to evolve, be renamed, and split or merged with other codes throughout the analysis process (Braun & Clarke, 2021). Coding can be an interpretive process across analysis, which moves beyond explicit meaning to explore implicit meaning, reflecting the researcher's engagement with the data, and their reflexive interpretation (Braun & Clarke, 2021). For these reasons data saturation is incompatible with reflexive thematic analysis, although may still be useful for other methods of thematic analysis (reliability, codebook).

Due to this, data saturation was not used in the current study, instead the researcher used the concept of theoretical sufficiency (Dey, 1999) and information power (Malterud et al., 2016). The researcher reflected on the richness of the data and considered whether it answered

the research aims (Braun & Clarke, 2021). Therefore, recruitment ended only once the researcher felt there was a richness and quality of data to meet the research aims. The demographic variables of the sample were also considered, as it was deemed important to the research aims that the sample consisted of different genders. This was due to females largely being overrepresented in DE research and if only females were recruited to the current study, it would not aid understanding about experiences of relationships with exercise and mind-body connection in recovery from DE for other genders. The final sample for this study consisted of 14 participants.

2.4.5 Data Collection

2.4.5.1 Demographic Information

Demographic data was collected from the participants to provide context to their experiences and perspectives, this supports the theoretical underpinnings of qualitative research which poses that knowledge is situated in context (Braun & Clarke, 2013). The findings of this research must be considered through the context of the participant sample. Participants provided information on gender identity, age, and ethnicity. They were also asked to provide details on the length of time they struggled with DE thoughts/behaviours, length of time in recovery from DE, and their relationship with exercise during DE and in recovery. The rationale for collecting this data was to understand the context in which the participants experiences occurred, and whether these impacted on their relationships with exercise and mind-body connection in recovery from DE.

2.4.5.2 Development of Interview Schedules

The development of the interview questions was considered in the context of the relevant theory and clinical application and included open-ended questions with the aim of generating novel insights, which is in accordance with the mixed inductive and deductive approach taken. The

initial draft interview schedule (see Appendix F) was shared with research supervisors and their feedback sought; amendments were made based on their advice. These changes were focused on staying close to the research aims and amending open ended questions to encourage more reflection.

The interview questions were sequenced to allow them to flow in a logical way, during the interviews this also allowed funnelling with questions beginning broad and then being tailored to the participants' responses to become more specific and sensitive (Braun & Clarke, 2013). The interview ended with the opportunity for participants to ask any questions or share any reflections they had following the interview.

2.4.5.3 Recording and Transcription

Interviews were digitally audio recorded using Microsoft Teams dictation feature. The audio recordings were held for one week before the transcriptions were checked and finalised, to allow participants time to withdraw their data. Transcriptions were checked at least once prior to familiarisation with and analysis of the data, to ensure accuracy.

2.4.6 Analysis

2.4.6.1 Reflexive Thematic Analysis Process

Braun and Clarke's (2006) six phases of thematic analysis were followed during data analysis, as outlined in Table 1. The researcher moved between phases, and themes, reviewing and refining them (Braun & Clarke, 2006). Initially the data was analysed inductively, and then deductively with theory being used to interpret the data (Braun & Clarke, 2021). The researcher's supervisors reviewed the initial coding to support the researcher to reflect on their work and identify any areas which may have been missed (Braun & Clarke, 2021).

Phase one: Familiarisation with the dataset. During this stage it is integral that the researcher becomes familiar with the data, which is achieved through reading and re-reading transcripts and listening to the audio recorded interviews at least once. Entries in the researcher's

reflective journal which were completed after each interview were also reviewed. During this phase initial reflections were noted, with an awareness of the researcher's personal values, clinical experience, and connection to the research aims.

Phase two: Generating initial codes. Initial codes were generated by the researcher working through the dataset systematically. Meaningful and/or interesting aspects of the data were given code labels. Code labels were both explicit and implicit in their interpretation. Initial codes were inductive, with deductive analysis later being used to view the data in the context of existing theory. When the entire dataset had been coded, code labels were collated with the supporting data.

Phase three: Searching for initial themes. This phase aims to identity patterns of meaning across the dataset. This is done by collating codes which share concepts and meaning in relation to the research aims. Initial themes were created from the researcher's interpretation of the codes within the dataset, these themes were then organised and collated with the supporting data.

Phase four: Developing and reviewing themes. The initial themes were reviewed against the dataset and the research aims. With support from the researcher's supervisors, themes were revised during this phase, some themes merged to create new overarching themes, and others were discarded. The use of research supervision and continued reviewing of the dataset created themes that were reflective of the participants' experiences and grounded in the data.

Phase five: Defining and naming themes. Each theme was summarised, and then given a name which was informative and reflective of the participants' experiences. Research supervision supported creating theme names which were reflective of the language used by the participants, to again support understanding their experiences and allow their voices to be heard.

Phase six: Producing the report. The final phase is producing the report of the research, with a focus on developing a narrative of the data.

Participant quotes, provided with pseudonyms, from the dataset are used to support the generated themes. The findings of the data analysis were then considered in the context of existing theory and literature.

Table 1. Phases of Thematic Analysis (Braun & Clarke, 2006)

Phases of Thematic Analysis	**Description of the Process**
1. Familiarisation with the data	Reading and re-reading the data transcripts, making initial notes and reflections.
2. Generating initial codes	Identifying preliminary codes, which appear relevant and meaningful to the research aims.
3. Searching for initial themes	Interpretative analysis of the codes, the researcher begins organising data and creating preliminary sub-themes and themes.
4. Developing and reviewing themes	Ensuring themes reflect the initial coding, as well as the complete dataset.
5. Defining and naming themes	Names and definitions of the themes are described, to tell the narrative of the dataset.
6. Producing the report	Quotes from the data are used to reflect the defined themes, aims of the research, and wider theoretical literature.

2.4.6.2 Deductive Analysis

Deductive coding was completed between phases three and four of the analysis. Study data was reviewed with consideration of how well it supported or contradicted the relevant theory. The deductive coding

framework was not used to explicitly ask participants questions. Rather, the deductive coding framework was used to develop a nuanced understanding of the data. The data was reviewed in consideration of how well it reflected existing theories and models of DE, mind-body connection, and compulsive exercise.

2.4.6.3 Deductive Coding Framework

Table 2. Deductive Coding Framework

Deductive Coding Framework	**Theory/Model**	**Considerations During Analysis**	**Code**
How does this support or contradict the data?			
Compulsive Exercise	CBT Maintenance Model of Compulsive Exercise & Compulsive Exercise Test	Do participants describe weight and shape concerns in their relationship with exercise? Has this changed since being in recovery?	A
Compulsive Exercise	CBT Maintenance Model of Compulsive Exercise & Compulsive Exercise Test	Do participants describe affect regulation as a motivator to engage in exercise? Has this changed	B

		since being in recovery?	
Compulsive Exercise	CBT Maintenance Model of Compulsive Exercise & Compulsive Exercise Test	Do participants describe exercising in a compulsive manner, feeling the urge to exercise to avoid negative consequences? Has this changed since being in recovery?	C
Compulsive Exercise	CBT Maintenance Model of Compulsive Exercise & Compulsive Exercise Test	Do participants describe exercising in a rigid way? Has this changed since being in recovery?	D
Mind-Body Connection	Theories of Mind-Body Separation in Disordered Eating	Do participants describe an embodied experience in recovery? Was a splitting experienced with struggling	E

		with disordered eating?	
Mind-Body Connection	Research on Exercise Supporting Mind-Body Connection	Do participants describe being aware of their mind-body connection during exercise? Do participants describe mind-body connection influencing their relationship with exercise?	F
Mind-Body "Splitting"	Research on "splitting" in eating disorders and disordered eating & Scale of Body Connection	Do participants describe wanting to disconnect their minds and bodies? Do participants describe unifying their minds and bodies in recovery, or through exercise?	G

2.5 Reflexivity and Quality Assurance

In quantitative research there are standardised criteria for monitoring quality and evaluating bias, however, this is not the case in qualitative

research (Braun & Clarke, 2013). The concepts of reliability and validity are not theoretically coherent with qualitative methodology, as this qualitative research assumes that meaning is both situated in the context and influenced by the researcher (McLeod, 2001).

Mays and Pope (2000) argue that similarly to quantitative research, to ensure rigour and quality, qualitative research must also use systematic research design, data collection, interpretation, and communication. As is consistent with the critical realist epistemology, the generation of themes from the dataset is influenced by the researcher's own personal and clinical context (DeForge & Shaw, 2012). Therefore, it is important that the researcher reflects on their own experiences and biases throughout the analysis process, which is aided by using a reflective diary (Braun & Clarke, 2006). The reflective diary is considered a way to enhance the interpretive quality of the analysis (Ortlipp, 2015), it allows the researcher to consider their own position in relation to the data during data collection and analysis. To further ensure quality assurance, the researcher shared the codes they had generated with their research supervisors to allow reflection on how the data was coded, the ideas which led to the development of themes, and to identify any areas of the data which the research may have overlooked (Braun & Clarke, 2021).

Mays and Pope (2000) have generated several questions to support researchers to evaluate quality in qualitative research. These questions are answered in response to the current research in Table 3 below.

Table 3. Quality in Qualitative Research

Question	**Evidence**
Worth or relevance. Was this piece of work worth doing, has it contributed to knowledge?	The study contributed to our understanding of DE, and individuals' experiences of their relationship with exercise and MBC

	in recovery. This area of focus has not been explored before, and therefore provided novel insights.
Clarity of research question. Was the research question clear?	The research question was clear and appropriate to the aims of the study. Which were to understand more about individuals' lived experiences of their relationship with exercise and MBC in recovery from DE.
Appropriateness of design. Would a different method have been more appropriate?	An alternative to the thematic analysis method would have been IPA, which is suited to the aims of this study, exploring experience, and is also mostly consistent with the researcher's epistemological position of critical realism. However, it lacks the theoretical flexibility that reflexive thematic analysis offers (Braun & Clarke, 2021).
Context. Is the context or setting adequately described to allow the reader to relate the findings to other settings?	The methods section describes the setting, including where the research was advertised (Facebook and Instagram) as well as where the interviews were conducted (MS Teams). Conducting the interviews online allowed for participants from across the UK to take part.
Sampling. Did the sample include the full range of possible cases, so	The sample included a mix of DE presentations, engagement with

that conceptual rather than statistical generalisations can be made?	exercise, age, and gender. There was a lack of male participants.
Data collection and analysis. Were the data collection and analysis procedures systematic?	Data was collected by semi-structured interviews a method that is compatible with reflexive thematic analysis (Braun & Clarke, 2006, 2019) which was deemed most appropriate for the research aims. Data analysis followed Braun and Clarke's (2006) six phases of thematic analysis.
Reflexivity of the account. Did the researcher self-consciously assess the likely impact of the methods used on the data obtained?	The researcher kept a reflexive diary throughout the research process, an account of which is provided.

2.6 Service User Involvement

Meaningful service user involvement has been found to have a positive impact on research quality, and participant experience (Staley et al., 2013). Therefore, it was felt to be important to include experts by experience in the development of this research study, particularly given current understanding of DE and its context (see extended background).

During the initial study design staff and volunteers from First Steps ED (a mental health and specialist eating disorder charity) were consulted. Most staff and volunteers at First Steps ED have lived experience of DE and eating disorders and were therefore able to reflect on their own experiences of DE, as well as their experiences of supporting their service users. These consultations supported the development of the interview schedule and the study advert. First Steps ED also advertised

the study advert on their social media channels (Facebook and Instagram).

2.7 Ethical Considerations

Ethical approval was granted by the University of Nottingham's Department of Psychiatry and Applied Psychology Ethics Committee (Appendix A) on 11th December 2022 (reference: 2993). This study was conducted in accordance with ethical recommendations proposed by the British Psychological Society (BPS, 2014) and UK Policy Framework for Health and Social Care Research (2020). The relevant ethical considerations are discussed below.

2.7.1 Incentives and Reimbursement

Participants were provided with a £10 Amazon voucher in recognition of their time and contribution to the research. This was offered to express the researcher's gratitude to the participants for their involvement. Amazon vouchers were chosen to allow the participants to have more choice over what they could spend the voucher on, moreover it being a voucher meant that it could not be considered as a form of income and therefore not affect participants in receipt of benefits. As the interviews were conducted virtually, no travel expenses were incurred by the researcher or participants, and therefore no expenses were claimed for this.

The British Psychological Society (BPS, 2014) guidelines for participant reimbursement were adhered to; the reimbursement was written toward the bottom of the recruitment advert, and participants were informed that they would still receive the Amazon voucher if they withdrew from the study after completion of the interview.

2.7.2 Informed Consent

Once participants had contacted the researcher via the email address on the study advert, they were sent an electronic copy of the Participant

Information Sheet (Appendix C) and Consent Form (Appendix B). Participants were asked to read the participant information sheet before providing informed consent, they were then asked to sign the consent form electronically and return it to the researcher via email. Signed consent forms were stored in the study record on a dedicated secure University of Nottingham webserver (OneDrive).

2.7.3 Participant Withdrawal

The right to withdraw from the research was explicitly stated in the participant information sheet. Participants were informed that they could withdraw all their data (without having to give a reason) during the interview or within a week after completion of their interview. Participants were informed that if they withdrew up to one week after their interview, their data would be withdrawn and would not be used in the analysis. Participants were informed of their right to withdraw at any time, however, should they withdraw after the one-week period, the information collected so far could not be erased and may still have been used in the analysis. The rationale for this was that after a week the interviews transcriptions were already being checked by the researcher, and initial codes may have started to be generated. This was explained in the participant information sheet and consent form. No participants withdrew from the study after completion of their interview.

2.7.4 Risk of Harm and Debriefing

The risk of harm as a result of participating in this study was considered to be minimal. It was agreed that if participants became distressed during their interview, they would be offered the opportunity to take a break or to end the interview and they would be signposted to appropriate support services. All participants were provided with a Participant Debrief Form (Appendix D) after their participation, which also included signposting to appropriate support services.

Participants were informed of the limits to confidentiality in the participant information sheet. This explained that should risk or safeguarding concerns be disclosed during participation, confidentiality may need to be breached, and relevant agencies informed, in accordance with safeguarding policy. If immediate risk was present, the researcher would adhere to local risk management policies and inform emergency services. No participants reporting experiencing distress during the interview process, and no risk of safeguarding concerns were identified during any of the interviews.

At the start of each interview participants were advised that they could answer as many or as few questions as they felt comfortable with and could give as much or little detail as they wished. They were advised the researcher would not question their decision if they chose not to answer a question. All the participants answered all the questions asked.

2.7.5 Confidentiality

Confidentiality was explained to all participants prior to participation in the Participant Information Sheet (Appendix C). Any personal identifiable information provided during interviews was removed from the transcripts and omitted from the research report. Participant confidentiality was further ensured using pseudonyms and identification codes to store study data in computer files. Pseudonyms were also used during transcription, analysis, and report write up.

2.8 Data Protection and Storage

The data collected and stored from this study was done so in accordance with the Data Protection Act (2018), and Data Protection Regulation (2018). All researchers endeavoured to protect the rights of the participants to privacy and informed consent. Only the minimum required information was collected and stored. Personal identifiable information (e.g., signed consent forms, participant information and contact information) were stored on a secure, password-protected university

webserver (e.g., OneDrive). Interviews were audio-recorded using Microsoft Teams and the audio file was deleted after transcription and veracity checks. Anonymised interview transcriptions were stored on the main researcher's university OneDrive account.

2.9 Research and Dissemination Policy

This research portfolio was submitted to the Trent Doctorate in Clinical Psychology course in February 2024, and resubmitted following amendment in September 2024. The journal paper will be submitted for publication in a peer-reviewed journal and may be presented at relevant conferences. It is intended that the findings from this research will be disseminated to participants and colleagues who requested this.

Extended Results

The extended results section provides greater detail and description on the themes. Pseudonyms are used throughout to maintain the anonymity of the participants.

3.1 Change in relationship with exercise through enhanced understanding of mind-body connection

Participants' relationships with exercise had changed in recovery from their DE, and an increased understanding of their mind-body connection appeared to be the mechanism of change for this.

"if I go for a run now, would I? Would I have run if I wasn't going to lose any weight if I wouldn't burn any calories, would I? […] If the answer was yes then then that would be an OK reason to go […] But if I needed to answer it was the opposite, then I knew it came from a disordered place and then you still need to decide like, OK, am I gonna listen to me or the disorder?" Vienna

"my mind will tell me things about my body doesn't mean that I'll listen to it all the time. But actually that I can […] understanding that actually when I'm doing exercise […] I am telling myself something by doing that and you know, thinking it's OK to listen to that sometimes" Sam

Despite participants noting a change in their relationship with exercise, and this appeared healthier as it was no longer driven by compulsions, there still appeared to be a conscious effort in choosing whether to listen to the mind-body connection to guide whether they should engage with exercise or not. This was also guided by checking in consciously with their own minds to understand if it was their mind-body connection guiding them, or the DE voice, and again having to make the choice which one to engage with.

"I've got a lot more understanding of my kind of physical body and what my constraints are and what I can and can't do. And so there are days when, you know, I will force through an injury […] But it's not. It doesn't control my life like it used to" Ginny

"I want to stop exercising when I'm starting to feel like I'm not putting like my full energy into whatever I'm doing. But like before, I guess I just I just say suppressed that so that I would just do it anyway" Carol

Some participants compared their exercise behaviours, and ability to listen to and connect with their mind-body connection before and after recovery. Even when participants were not able to listen to their mind-body connection and continued to exercise despite feeling tired or noticing an injury in recovery, the difference appeared to be that they recognised this was not something that they should be doing, and that this was not beneficial for them. Ginny described this as a "*learning*" process,

suggesting that recovery is something that those with DE continue to engage with rather than defining a clear marker of being recovered.

For some participants, the comparison of their exercise behaviours also included comparisons with their training for competitive sports. For some mind-body connection appeared helpful for training, and for others they felt that even though they were aware of their mind-body connection they had to ignore the cues they received from their mind-body connection to engage in their training.

"I am trying to listen to my mind and body a lot better like I am trying more […] when you're training, you spend all your time listening to your mind and body and connecting. And then when you're really pushing it and working hard, that's when you have to like switch off […]" Daphne

"I think with training the trouble is as an athlete, you're often told stuff like oh, just push through. So that also kind of feeds into like, ignoring how you feel […] it really kind of masks what you should be listening to" Harriet

Daphne and Harriet both described feeling that they had to ignore the pain and push through when training hard, even though the mind-body connection was there, and they were receiving the cues. Daphne also believed listening to her mind and body was a key component of her training and discussed how she felt athletes had to be more attuned to their bodies during training.

3.1.1 Understanding how the mind and body are connected

Even though participants did not use the term mind-body connection when describing their experiences, before it was raised in the interviews, it was something that they were able to accurately describe. They also made sense of their own experiences through their mind-body connection,

and considered how these experiences had changed when they were in recovery from DE. It felt important to include in the results the participants own understanding of mind-body connection, as this was a term that they did not regularly use, and for some a new term altogether.

"I think now I'm really like self-aware. I kind of know myself quite well now and I even know like when something is off and I, but I also know when something's like going really well […] So then when I started to actually listen to myself a bit again, I was a bit like. Am I fine or like am I injured or am I fine like it was a bit confusing because I it was almost like I'd completely lost lost any like sense of how to listen to myself" Harriet

" *the biggest thing for me is my body is just my house. […] Like it's just my little flesh suit that I have to wear […] I want the flesh suit to be happy and healthy because then me inside flesh suit can be happy and healthy. So that that it was an integration that took time and a lot of realizations that mind and body are not the same thing but equally you have to use them in integration with each other." Kye*

When making sense of their own understanding of mind-body connection, most participants compared the relationships they had with their minds and bodies while they were struggling with DE, and their relationship with them now that they are in recovery.

3.1.2 Managing emotions

Not only did participants describe using exercise to regulate their emotions, but Lisa also reflected that she believes her DE was another way to help her with emotion regulation. She described that engaging with the DE and restricting her food intake helped her to disconnect from the anxiety she experienced, but that this came back in recovery.

"I had an eating difficulty because I was so damn anxious to calm my anxiety down so in that way I chose to disconnect the two [mind and body] […] even now like if I'm coming up to a stressful time my thoughts will go to oh you know what this would be so much easier to cope with if I just eat a bit less for a few weeks" Lisa

When Lisa began to reconnect with her mind-body connection and begin to engage in recovery she found that her anxiety returned, and even in recovery she considers returning to her DE behaviours to manage anxiety.

"There is nothing I have found but relaxes me as much as running […] I tend to get quite angry if I don't do it. It just it makes me feel physically better. It makes me feel just a lot calmer […] able to kind of tackle what's what else is out there" Ginny

Ginny described how running helps her to relax, and to keep her calm. This occurred both through the act of running, and through avoiding not engaging with exercise which can leave her feeling "*angry*".

3.1.3 Strong not skinny

Wanting to gain strength and feel strong in recovery motivated many of the participants to engage in exercise in recovery from DE. This appears to be a healthy shift; however, it would have been useful to have a deeper understanding how what feeling or being strong meant to the participants. Strength can be considered in several ways, mental fortitude, physical ability, and physique.

"I think my relationship with my body would need to improve in order to 100% exercise for the right reasons. I think there's always a little bit, even when I go climbing, there's still a little part of me that's like, right, OK, maybe not gonna lose weight, but maybe I'll, you know, I'll tone my

legs. Maybe I'll, you know, get upper body strength, which in theory is good, but it can also be disordered" Vienna

Despite the focus on gaining strength appearing to be a positive shift in motivation to exercise in recovery. As described by Vienna, an evaluation of physical appearance remained. Although her focus has moved from losing weight, she is considering the benefits of gaining upper body and leg strength and describes her legs becoming more toned which is an appearance focused goal.

3.2 What the body can physically do

Although the participants' physical health conditions occurred at different stages in their lives and recovery journeys, they all impacted on the participants' relationship with their mind-body connection and exercise in recovery from DE. This theme is more unique in that the change in their relationship with exercise was more a result of their physical health conditions, than increased awareness of mind-body connection.

"So I feel like that [having a stoma fitted] has definitely changed the way in how I view my body and what my body can do and might change my mindset a bit as well. Because now I think I feel a lot more." Dianna

Dianna's stoma was fitted while she was in recovery from DE, this appeared to be the main thing that changed her relationship with both her mind-body connection and exercise. Whilst the stoma put many restraints on what Dianna could do in terms of physical activity, she was able to see the positives in her change of mindset in the way she views her body.

"I ignored any sign that my body hurt and then I just if my body crashed that kind of either felt I deserved it or well, it's just one of those things, but now I think because of the lupus I have become a lot more aware of it" Sally

"I think because when it's physical health, I feel much more able to listen to my body" Dianna

It appeared important to the participants with physical health conditions that their physical and mental health were differentiated between. In some ways, it was easier for them to listen to their mind-body connection when this was related to their physical health rather than their mental health i.e. their DE.

"it's somehow easier to understand when someone likes says I'm in physical pain rather than emotional pain that you kind of can't see" Dianna

Dianna attributed the difference between physical and mental health, being that the physical health difficulties can be more easily seen by other people. Although mental health problems are more widely spoken about and understood in society, stigma and misunderstanding remain which could be one explanation for physical health problems being easier to listen to and understand. With even those struggling with mental health problems such as DE finding physical health easier to understand and attend to

3.2.1 It just broke

Similarly to the previous theme, '*what the body can physically do*', this theme concerned the participants' physical bodies. It pertained to difficulties that participants had with their physical health while struggling with DE rather than in recovery, and therefore was not included in the journal paper but still felt important to explore and present.

Lisa described blamed her DE for the development of her Irritable Bowel Syndrome (IBS). Lisa continuing to struggle with IBS in recovery

may influence her current relationship with exercise and MBC, due to the physical impact of the illness.

"I don't believe I had IBS before I started messing around with all my food" Lisa

Jackie sustained an injury running whilst struggling with DE. At the time, this did not change Jackie's relationship with exercise and despite a broken hip she continued to exercise.

"I didn't fall. I was out running, but it [hip] just broke because of the impact of my foot on the pavements, my bones were so weak" Jackie

"I still went to the gym […] I had to have a dynamic hip screw put in because it was really it was bad. But hobble up to the gym on my crutches" Jackie

Looking back, Jackie acknowledges how unhealthy this was, describing it as *"completely, completely mad".* In recovery Jackie can look at her bodily symptoms to understand that she still needs to work on herself and improve her physical health, despite thoughts that she is doing well.

"I can know though I'm still unhealthy because I'm breaking my bones, and I haven't got my period, but my body feels fine … My periods aren't here yet, but my brain says I'm fine." Jackie

The thoughts that Jackie was having about being "*fine*" despite her physical health remaining poor, could represent the DE thoughts rather than her own logical thoughts and being able to tune into her MBC.

Jackie acknowledged that not getting her period back, was a sign that she was not yet physically healthy. Daphne's period has returned she has been in recovery.

"I've had like […] three periods [since being in recovery] and honestly, I will never be more excited about getting a period. It is great and realizing the benefits of that and how much better you feel was a massive shift in do you know what, like being healthy is so much more important than anything you can get from your sport" Daphne

Daphne described feeling excited that her periods have returned, and again highlights the shift in a relationship with exercise and MBC in recovery. She is now able to realise how much more important her health is than engaging with sport.

Extended Discussion and Reflection

The extended discussion and reflection section expands on the journal article discussion.

4.1 Findings in Relation to Previous Literature and Theory

These qualitative findings appeared to support existing literature that mind-body connection can be "split" while individuals are struggling with DE and eating disorders (Granieri and Schimmenti, 2014). They also supported the evidence that DE and eating disorders can be self-destructive, with participants describing ignoring injuries, illness, and mental distress to engage with DE behaviours including compulsive exercise (Cook-Cottone, 2020). However, it could be argued that both the negative experiences of pushing down bodily and mental cues, and positive experiences of listening to the body and engaging in mindfulness both illustrate the embodied experience (Cook-Cottone, 2020).

An increased awareness of mind-body connection was helpful in allowing participants to move from an embodied experience which was unhealthy, or destructive, to a healthier embodied experience. In recovery, with an increased awareness of mind-body connection individuals chose to engage with exercise for reasons not focused on weight loss, and which were not driven by compulsion. Instead, they engaged with exercise to manage difficult emotions, to increase their physical strength, and as a way of connecting to their bodies through mindful engagement.

One difficulty in understanding the participants' relationship with mind-body connection in recovery from DE was their lack of awareness of the term mind-body connection, this term was something that the researcher used during the interviews. Whilst all the participants understood the term once it was raised and were able to give accurate descriptions of their own experience of mind-body connection it was perhaps not a term they would have used without prompt to conceptualise their experiences. This reflects findings of a systematic literature review of experiences of mind-body connection in treatment for eating disorders. The review found that although mind-body connection was discussed and experienced by patients and used to conceptualise experiences by the practitioners and researchers, it was not labelled as such with patients (Cropley et al., 2024 [unpublished]).

Participants were at different stages in recovery when it came to being able to listen to their mind-body connection to guide their behaviours, which could raise questions about whether they are recovered from their DE or not. Some participants still choose to engage with exercise to change their physical bodies, such as wanting to tone their legs or gain physical strength. Others also described finding exercise to be the one thing that allowed them to manage their emotions over other things, which highlights a level of exercise dependence which may still be defined as compulsive. Although, it could be that recovery sits on a spectrum, it has been suggested that there are two stages to recovery

when focusing on mind-body connection (Cook-Cottone, 2015; Tylka, 2011). The first stage being awareness of one's internal and external needs: being able to recognise the physiological, emotional, and cognitive experiences of the self (Cook-Cottone, 2015). The second stage is being able to listen to and respond to these cues, by engaging in mindful self-care (Cook-Cottone, 2015). Therefore, the participants in this study likely sat across the stages, this might have been useful to operationalise before conducting the study to get a further insight into the participants' recovery journeys. However, before conducting the interviews the researchers could not predict what the participants' experiences of mind-body connection in recovery from DE would be, or how much awareness they would have of this, in order to operationalise it.

Whilst participants had not considered their mind-body connection prior to the interviews, and less data was available on this, participants appeared to have greatly considered their relationships with exercise. All but one participant engaged with exercise in recovery. The motivating factors to engage with exercise were to maintain or improve physical health for those with physical health conditions, to manage emotions, and to build strength. It appeared that participants were able to engage with exercise in recovery from DE in a healthier way (without engaging in rigid compulsive behaviours, without the drive for thinness) by becoming more aware of their mind-body connection. This supports previous literature which suggests that exercise in recovery from DE can be healthy and non-compulsive if the exercise is performed in a mindful and embodied way (Hockin-Boyers & Warin, 2021). The positive relationships found among these participants in recovery from DE support suggestions that those in recovery should be able to engage in exercise (Calogero & Pedrotty, 2004; 2007), particularly as for some exercise was also useful in improving their physical health when managing long term health conditions. However, exercise was still used to manage emotions and potentially influence body image. Therefore, if exercise is to be recommended in recovery from DE caution needs to be taken as there is a

fine line between compulsive exercise, and a healthy relationship with exercise in recovery, which is influenced by mind-body connection.

4.2 Strengths, Limitations and Future Research

A strength of this study was the contribution of experts by experience from First Steps ED. They along with The Female Athlete Triad were invaluable in recruiting participants as both shared the study advert online. However, this may have been one of the contributing factors to the sample being made up mainly of participants who identified as female. It is likely that those who follow The Female Athlete Triad are also female, as this channel shares experiences of females and relative energy deficiency in sport. Therefore, it may have been helpful to have also shared the study advert with a male focused recovery channel to have a sample that was more representative of the DE population (Mitchison et al., 2014; Murray et al., 2022).

The current study benefitted from recruiting participants who engaged in exercise in different ways, from those who no longer exercised in recovery, to those who still exercised to compete in sport. The inclusion of those who exercised competitively was likely again a result of recruitment through The Female Athlete Triad. Whilst it was beneficial for the study to include a broad range of exercisers, this may have impacted on participants' relationships with exercise, due to their circumstances. Future research could benefit from comparison across relationships with exercise before and during recovery from DE, including the ways in which participants engage with exercise. Three participants had been competitive athletes before their DE, and two remained competitive athletes in recovery. Continuing to engage in competitive exercise likely impacted on these participants' relationships with exercise, as their engagement would not always have been driven by their own choices, and during training sessions, as they described, they have to "*push through*" and disconnect from their mind-body connection. Therefore, these participants due to the nature of training for competitive sport,

continued to engage in features of compulsive exercise. This reflects existing literature which suggests engagement with exercise for competition sits on a spectrum with DE (Godoy-Izquierdo et al., 2023).

The demographic data collected suggests that there was a skew towards younger age participants, with 11 of the 14 participants under the age of 30. Therefore, the findings of this study need to be considered in view of cohort effects which may have impacted on participants' experiences, and their appraisals of these, particularly when considering the importance of societal expectations on body image and body dissatisfaction, and how these expectations have changed over time. Moreover, while traditionally DE was seen as a problem of adolescents, it has more recently been suggested that DE is something which can be seen across the lifespan (Carrard et al., 2020; Tzoneva et al., 2015). Thus, future research would benefit from exploring experiences of those over the age of 30 in recovery from DE and their relationships with exercise and mind-body connection.

The findings of this study ought to be interpreted with consideration of the researcher's professional membership, as well as their clinical and personal experiences of DE and exercise. Whilst the researcher has personal and clinical experience of DE and this was helpful in having an awareness of the experiences of the DE population, there is the possibility that aspects of the data may have been highlighted due to their own experiences. The researcher personally found exercise helpful in improving her own relationship with eating, and her body, and is passionate about the physical and mental health benefits of exercise. Therefore, they may have been more likely to be drawn to quotes and codes which support the use of exercise in recovery from DE.

Future research could benefit from increased involvement of experts by experience through all the stages of the research process, from conceptualisation to data analysis. Experts by experience could have provided valuable insight, and alternative opinions and interpretations

during the analysis stage, further representing the experiences of those in recovery.

This study was the first qualitative study to explore the relationships individuals in recovery from DE have with exercise and mind-body connection and highlighted the benefit of increased awareness of mind-body connection supporting an improved relationship with exercise. Whilst the use of qualitative methodology and semi-structured interviews allowed for an in-depth exploration of participants' experiences, due to the small sample size these findings cannot be generalised to the wider population of those in recovery from DE. In future research a mixed-methods sequential exploratory approach may be beneficial to allow the results from the qualitative stage to be condensed into a survey, which could then investigate how well endorsed the themes are within a larger sample of those in recovery from DE. Although, as this was a qualitative study its aims were not to create a piece of research that could be generalised across a population. Rather, it was interested in hearing the experiences of those recruited from this population and creating meaning and an understanding of this group's experiences.

4.3 Clinical Implications

4.3.1 Exercise in Recovery from Disordered Eating

The findings of this study suggest that exercise is important to those in recovery from DE, and that many continue to exercise while in recovery. Participants were motivated to engage in exercise to support physical health, manage emotions, and to improve strength, goals not dissimilar to those who have not experienced DE (Portela-Pino et al., 2020). Therefore, exercise ought to be encouraged in recovery from DE to support individuals to improve their physical and mental health, while also increasing awareness of their mind-body connection. The participants in this study sat across the full spectrum of DE, with some previously receiving eating disorder diagnoses, thus, the findings of this study might also have relevance to individuals with diagnosed eating disorders.

Those in recovery from DE could benefit from the LEAP programme (see section 1.7 in introduction), which supports those who have previously experienced compulsive exercise to begin exercising in goal, age, and health appropriate ways (Hay et al., 2018). At present LEAP has not been tested across all eating disorder diagnoses, or DE. Yet, its focus on goals and health relate to the motivations of the participants in this study to engage with exercise, which suggests it could benefit those with DE.

This study also suggests that the CBT maintenance model of compulsive exercise (Meyer et al., 2011) would be beneficial in guiding engagement with exercise in recovery from DE. When discussing their exercise behaviours while struggling with DE, most participants of this study described the features of the CBT maintenance model of compulsive exercise in the behaviours they were exhibiting (weight and shape concerns, psychological dependence on mood regulation, compulsivity, and behavioural rigidity). In recovery from DE, their compulsivity and behavioural rigidity had reduced, however, participants still used exercise for emotion regulation, and potentially to manage concerns about shape when considering the want to be *strong not skinny*. Therefore, the CBT maintenance model of compulsive exercise (Meyer et al., 2011) could be used as a clinical tool to understand individuals' current relationships with exercise and how compulsive that is. As well as highlighting areas of concern that may still need to be addressed in recovery, such as psychological dependence on mood regulation if exercise is their own way of emotionally regulating.

4.3.2 Increasing Awareness of Mind-Body Connection

Despite participants in the study being largely new to the term mind-body connection, a deeper understanding of what their minds and bodies could do and how to listen to this appeared to be a key driver in changing their relationship with exercise. Therefore, interventions or preventative

approaches which focus on mind-body connection would be beneficial in treating and preventing the development of DE and compulsive exercise. A greater awareness and understanding of mind-body connection could be achieved through psychoeducation, or through exercise. There are existing mind-body exercises including Body-Mind Centering, Authentic Movement, 5Rhythms, Focusing Techniques, and Body-Mind Psychotherapy (Shapiro, 2020). However, the participants in this study did not describe engaging in any of these. It could be that any form of exercise is able to increase awareness of mind-body connection, with research already finding that several other forms of exercise can support mind-body connection (Shapiro, 2020). The important aspect appears to be a focus on the embodied experience of the movements, to understand the lived experience of physical expression, thoughts, emotional experiences, and overall well-being (Shapiro, 2020).

An understanding of mind-body connection, and how to able individuals are to listen to this in recovery from DE could also serve as a tool to monitor their recovery, following suggestions that there are stages to being able to live in an embodied way (Cook-Cottone, 2015; Tylka, 2011). The findings of this study, along with previous findings by Cook-Cottone (2015) suggest an initial step in recovery when guided by mind-body connection is awareness of one's internal and external needs, being able to recognise the physiological, emotional, and cognitive experiences of the self. The next stage would be to be able to listen to and respond to these cues, by engaging in mindful self-care and exercise which is not driven by compulsive behaviours (Cook-Cottone, 2015).

4.3.3 Improving Emotion Regulation Skills

One of the main reasons that participants in this study continued to engage with exercise was the benefits it had in supporting emotion regulation. Using exercise for emotion regulation is not inherently a bad thing, with this being common among the general population who do not struggle with DE and compulsive exercise (Escobar-Roldan et al., 2021;

Kramer, 2020). It does however become a difficulty when individuals develop a psychological dependence on mood regulation from exercise, and the individual does not have other coping skills to manage difficult emotions (Boyd et al., 2017). Therefore, teaching other emotion regulation skills would be beneficial for those with DE so that they do not become reliant on exercise for this. This is particularly pertinent, as recent research has found that those with DE and poor emotion regulation skills are more likely to engage in purging, and compulsive exercise (Dougherty et al., 2020). Although, this was one of few studies to investigate emotion regulation skills and DE, therefore, further research is still needed in this area.

4.4 Critical Reflection

The critical reflection section contains the researcher's personal reflections on the process of this research, including any challenges faced. Reflexive diary extracts are included throughout, to add context and aid understanding.

4.4.1 Conceptualising the Research

My interest in DE initially developed from volunteering with First Steps ED during my undergraduate psychology degree. It was during my voluntary work that I became more aware of my own relationship with exercise and eating and acknowledged that I likely had been struggling for a long time with DE and compulsive exercise. By the time I got to university this had improved, however, I was still fixated on health and exercise and experienced a lot of rigidity around my exercise and eating behaviours despite then being at a healthy weight. One of the big motivators for me to improve my relationship with food and exercise was beginning to participate in obstacle course racing, to improve my performance I realised I had to take better care of my mind and body and have worked to do that ever since. Engaging with exercise in a driven way such as this, taking the focus from bodily shape and moving toward performance

helped to improve my own DE and I found it improved my general mental health as well. Although, having never received treatment for compulsive exercise, I felt I never knew if my new relationship with exercise was healthy or "normal".

When supporting service users at First Steps ED, many described what could be considered compulsive exercise behaviours, and had been advised by their GP or other practitioners that they should stop engaging with exercise due to their poor physical health as a result of their DE or eating disorder. Whilst I could understand how detrimental exercise could be for their physical health when they were a low weight, I also understood personally how beneficial exercise could be for recovery in supporting emotion regulation and providing motivation for improving eating behaviours. It therefore felt difficult to back up the advice they had been given to stop exercising. However, there was little clinical or theoretical evidence to support the personal experience I had and thus I reinforced the advice for the service users to stop exercising.

For my specialist placement on the Clinical Psychology Doctorate, I chose to be placed in a children's and an adult's community eating disorder teams. Much like when I worked at First Steps ED, I again witnessed the difficulties patients face in understanding their relationships with exercise and mind-body connection. My supervisors in both teams are passionate about understanding exercise in eating disorders and have agreed with me that there is at present a lack of guidance to support individuals to improve their relationship with exercise. We have discussed how eating disorder services work from a multidisciplinary approach, including nurses, psychologists, support workers, and dieticians to support most areas of health. However, physiotherapists and personal trainers have yet to be included in eating disorder teams, despite the well-known physical and mental health benefits of exercise (Belcher et al., 2021; Bernstein & McNally, 2018). The lack of clinical and theoretical evidence I could find to support the use of exercise in treatment, or

advice for how to healthily engage in exercise in recovery prompted my drive to research this area.

By the time I came to consider this project research was emerging on the use of yoga in treatment for DE, and the benefits appeared to be related to the mind-body focus of yoga. I also became aware of yoga therapy, with one of my research supervisors being a qualified yoga therapist. It was this that prompted me to also want to explore the relationships those in recovery from DE have with mind-body connection. I completed a systematic literature review on the understanding and experiences of mind-body connection in individuals with lived experience of eating disorders (I hope this will be published soon). This found that mind-body connection was not labelled as such by individuals with experience of eating disorders, but that mind-body connection and the eating disorder were utilised to regulate distress often through a splitting of the mind and body (Granieri and Schimmenti, 2014). The cross over between the regulatory effects of splitting the mind and body and using compulsive exercise to regulate emotions (Meyer et al., 2011), alongside suggestions that exercise with a focus on mind-body connection can support recovery from DE and compulsive exercise (Bardone-Cone et al., 2016; Mond & Calogero, 2009) is what motivated me to explore the two in this study.

Something else I considered during the development of this research was the role I played as the researcher, while also holding an identity as a professional in this field, and an individual in recovery from DE. I hoped this would allow me to bring a rounded perspective to the research, considering multiple perspectives, but I also wondered how to "*not slip into therapy mode*" during the interviews while listening to the participants experiences. I reflected on this throughout my reflective diary (see section 4.4.4) and in research supervision.

4.4.2 Deciding on the Qualitative Methodology

Prior to the Clinical Psychology Doctorate, I would have said that I held a more positivist stance towards knowledge, I believed there was a truth or finite answer to be found, which led me to favour quantitative methods. During training I found that my epistemological position shifted, I believe this was due to my exposure to multiple perspectives and opinions, as well as the qualitative teaching we received. This was the first teaching on qualitative methods I had received which appeared to value qualitative and quantitative methodology equally. On the previous university courses I had been on, I felt that there was a sense that quantitative methods were theoretically more valid than qualitative methods. As my own opinions and pursuit of knowledge changed, I began to endorse a critical realist stance. This change is what influenced my choice of qualitative methodology for my thesis, my choice of reflexive thematic analysis allowed for the exploration of individuals' experiences while acknowledging their social and cultural contexts. I did however feel anxious about employing this methodology, having previously used quantitative methods. I did wonder if it would make more sense to "*stick with what I know*" when my thesis is such an important piece of work in my career and completion of the Clinical Psychology Doctorate. My passion for the subject area further increased these worries as I wanted to create something "*meaningful*", while also "*doing justice to the participants' experiences when they have made the brave choice to share their experiences with me*". I adopted Braun and Clarke's (2006; 2009) principles to guide my analysis, as well as researching previous studies that had employed reflexive thematic analysis. This helped to increase both my competence and confidence in using reflexive thematic analysis, along with regular research supervision to reflect on my work.

4.4.3 Reflections on Sample Size

Having felt anxious about choosing a qualitative methodology, having no previous experience of reflexive thematic analysis, sample size was also something that contributed to my worries. I frequently worried about

what would be an appropriate sample size. I feel some of my previous positivist position influenced this as I wanted to have definite answer as to how many participants I needed, but there is a lack of guidance in this area for reflexive thematic analysis. To manage these worries I explored the idea of information power (Malterud et al, 2016), in which the researcher considers the richness of the data and how these meets the research aims. I also reminded myself of my critical realist epistemological position, which is not concerned with finding an absolute truth by being representative of the whole population being studied, but with exploring the individuals' perception of their reality and experiences (Lund, 2005). Therefore, the richness and quality of the data was more important than gaining a large sample size.

4.4.4 Interview Process

As discussed in the conceptualising the research section, I was aware of my multiple roles as a professional, researcher, and individual with lived experience of DE and compulsive exercise. I was worried about how I would maintain boundaries while conducting the research, not trying to problem solve or offer advice from a therapist stance, while also not bringing in my own biases and experiences as a person in recovery. Although, the benefit of reflexive thematic analysis is that it also allows for the researcher's experience and knowledge to guide the analysis process. This was something I reflected on a lot in my reflexive diary:

"I wonder if my motivations are right to be conducting this research or am I just searching for the answers I wish I had while I was struggling with my own exercise. Or even now, to make sense of the exercise I'm doing while I am in recovery, is my own relationship healthy, and who is to say what healthy is? My supervisor suggested I reflect on my own relationship with exercise, and I wonder if she is picking up on my multiple roles, and that I am someone in recovery even though I try not to discuss this with colleagues or supervisors?"

I wondered if participants would be able to identify my multiple roles through my behaviour in the interviews. As First Steps ED were advertising for me, I also wondered if any service users I had previously worked with in my role would participate and remember me from my time at First Steps ED as a Peer Support Worker, which would reveal my multiple roles.

"In my interview today one of the participants said something about me "knowing what it's like", and I wonder if they were acknowledging my knowledge of the field or if they have got the sense that I share a similar lived experience to them?"

During the interviews I attempted to adopt a position of curiosity to encourage participants to share their experiences with me. Although, I did find myself at times acknowledging my role as a professional working in eating disorders and as a researcher. I was mindful of the importance of validating participants experiences through my implicit and explicit communication but knew my role could not go further than this to offer support or advice. This was difficult as I found participants were very open in their communication and shared experiences which appeared to have been extremely difficult for them. To address this, I made sure to remind them that I would be sending them a participant debrief form that included information on support services should they feel they needed it.

"It's hard not to offer advice and support when people are being so open and vulnerable with me. It's reminded me why I want to do this research, as well as why I feel passionate about clinically working within this field. Let's hope this research can actually help make a difference."

I found that I possibly put more pressure on myself to "*get it right*" as I could feel the passion that both myself and the participants had for

the subject area. When I was thanking participants for their participation, many made comments around how they wanted to improve support for others and wanted to develop the field which increased my sense of pressure. This increased the emotional impact I felt from the interviews, and I often left the interviews feeling a combination of drained, sad, and motivated to do the best I could with my research.

"I hate that some of these participants haven't received any support for their disordered eating because they didn't meet service criteria for eating disorders services, despite how much their disordered eating has impacted their lives."

I tried to reflect on my emotions throughout the interview phase, as I did not want this to impact the analysis phase. Despite the emotional impact of the interviews, I was able to reflect on how grateful I am to be in a position where I can do this research.

4.4.5 Analysis Process

Whilst I was grateful for the number of participants that chose to take part in the study, when I approached analysing the data I did feel overwhelmed by the amount of data I had. I had enjoyed data collection and hearing the experiences of the participants but began to doubt my ability to analyse the data. Much like my initial worries about completing qualitative research, I again worried about "*getting it right*" and "*doing the participants justice*". I reflected in supervision how I felt like I had to capture all the participants' experiences and was spending a lot of time on each stage of the reflexive analysis process. These feelings increased as I began applying the deductive coding framework as I felt I had to develop themes and could not use all the data.

"*I feel bad that I can't include all the data, I know the participants have said how they felt the importance of contributing, and that they want to*

read the finished report. I'd feel terrible if they came to read it and felt I hadn't included their experiences or had interpreted them completely wrong."

I made sure to continue to discuss these worries in research supervision, as I did not want my own personal values and worries to influence my interpretation of the data too strongly. In supervision we reflected that although I may never be able to fully capture every participant's experience, reflexive thematic analysis views researcher subjectivity as an essential part of the analysis (Braun & Clarke, 2021). Therefore, I worked to capture the participants' experiences to the best of my ability, while reflecting on my own subjectivity.

4.4.6 Closing Reflections

Engaging in this reflective process has been useful in considering my role as a researcher throughout the different stages of the research. The experience has allowed me to learn more about my professional and personal values, considering who I want to be as a psychologist, and considering my epistemological position as part of this. Having found research an area of weakness of mine throughout the Clinical Psychology Doctorate, completing this study has encouraged me to continue to engage with research despite how difficult I find the process. I hope to continue research in this area as a qualified psychologist. I also hope to use the findings of this study to guide my clinical practice if I am to work in the field of DE in the future.

Extended Paper Word Count:

20, 973

20, 266 (excl. tables)

Total Word Count (Journal and Extended): 29, 687

References

Acolin, J. (2016). The mind–body connection in dance/movement therapy: theory and empirical support. *American Journal of Dance Therapy*, *38*(2), 311-333. https://doi.org/10.1007/s10465-016-9222-4

Adkins, E. C., & Keel, P. K. (2005). Does "excessive" or "compulsive" best describe exercise as a symptom of bulimia nervosa?. *International Journal of Eating Disorders*, *38*(1), 24-29. https://doi.org/10.1002/eat.20140

Alvarenga, M. D. S., Scagliusi, F. B., & Philippi, S. T. (2010). Development and validity of the Disordered Eating Attitude Scale (DEAS). *Perceptual and Motor Skills*, *110*(2), 379-395. https://doi.org/10.2466/pms.110.2.379-395

Andrew, R., Tiggemann, M., & Clark, L. (2015). Predictors of intuitive eating in adolescent girls. *Journal of Adolescent Health*, *56*(2), 209-214. https://doi.org/10.1016/j.jadohealth.2014.09.005

Ardovini, C., Caputo, G., Todisco, P., & Dalle Grave, R. (1999). Binge eating and restraint model: psychometric analysis in binge eating disorder and normal weight bulimia. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *7*(4), 293-299. https://doi.org/10.1002/(SICI)1099-0968(199908)7:4<293::AID-ERV273>3.0.CO;2-S

Augustus-Horvath, C. L., & Tylka, T. L. (2011). The acceptance model of intuitive eating: a comparison of women in emerging adulthood, early adulthood, and middle adulthood. *Journal of Counselling Psychology*, *58*(1), 110. https://doi.org/10.1037/a0022129

Avalos, L. C., & Tylka, T. L. (2006). Exploring a model of intuitive eating with college women. *Journal of Counselling Psychology*, *53*(4), 486. https://doi.org/10.1037/0022-0167.53.4.486

Bacon, L., Stern, J. S., Van Loan, M. D., & Keim, N. L. (2005). Size acceptance and intuitive eating improve health for obese, female chronic dieters. *Journal of the American Dietetic Association*, *105*(6), 929-936. https://doi.org/10.1016/j.jada.2005.03.011

Bardone-Cone, A. M., Higgins, M. K., St. George, S. M., Rosenzweig, I., Schaefer, L. M., Fitzsimmons-Craft, E. E., ... & Preston, B. F. (2016). Behavioral and psychological aspects of exercise across stages of eating disorder recovery. *Eating Disorders*, *24*(5), 424-439. https://doi.org/10.1080/10640266.2016.1207452

Bardone-Cone, A. M., Hunt, R. A., & Watson, H. J. (2018). An overview of conceptualizations of eating disorder recovery, recent findings, and future directions. *Current Psychiatry Reports*, *20*, 1-18. https://doi.org/10.1007/s11920-018-0932-9

Barker, C., Pistrang, N., Elliott, R., & Barker, D. C. (2002). *Research Methods in Clinical Psychology*. John Wiley & Sons, Incorporated.

Becker, C. B., Plasencia, M., Kilpela, L. S., Briggs, M., & Stewart, T. (2014). Changing the course of comorbid eating disorders and depression: what is the role of public health interventions in targeting shared risk factors?. *Journal of Eating Disorders*, *2*, 1-14. https://doi.org/10.1186/2050-2974-2-15

Belcher, B. R., Zink, J., Azad, A., Campbell, C. E., Chakravartti, S. P., & Herting, M. M. (2021). The roles of physical activity, exercise, and fitness in promoting resilience during adolescence: effects on mental well-being and brain development. *Biological Psychiatry:*

Cognitive Neuroscience and Neuroimaging, *6*(2), 225-237. https://doi.org/10.1016/j.bpsc.2020.08.005

Bergin, J. L., & Wade, T. D. (2012). A cross-sectional analysis of the cognitive model of bulimia nervosa. *International Journal of Eating Disorders*, *45*(6), 776-786. https://doi.org/10.1002/eat.22012

Bernstein, E. E., & McNally, R. J. (2018). Exercise as a buffer against difficulties with emotion regulation: a pathway to emotional wellbeing. *Behaviour Research and Therapy*, *109*, 29-36. https://doi.org/10.1016/j.brat.2018.07.010

Bhaskar, R., Danermark, B., Ekstrom, M., & Jakobsen, L. (2005). *Explaining society: an introduction to critical realism in the social sciences*. Routledge.

Boyd, C., Abraham, S., & Luscombe, G. (2007). Exercise behaviours and feelings in eating disorder and non-eating disorder groups. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *15*(2), 112-118.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology,*3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2013). *Successful qualitative research: a practical guide for beginners*. SAGE.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2021). Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research*, 21(1), 37–47. https://doi.org/10.1002/capr.12360

Braun, V., & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 18(3), 328–352. https://doi.org/10.1080/14780887.2020.1769238

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, 13(2), 201–216. https://doi.org/10.1080/2159676X.2019.1704846

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, *9*(1), 3. https://doi.org/10.1037/qup0000196

British Psychological Society. (2014). *BPS Code of Human Research Ethics* (2nd ed.). https://www.bps.org.uk/news-and-policy/bps-code-human-research-ethics-2nd-edition-2014

Brown, A., Fleetwood, S., Roberts, M., & Roberts, J. M. (Eds.). (2002). *Critical Realism and Marxism*. Psychology Press.

Bryant, A., & Charmaz, K. (2007). Grounded theory in historical perspective: an epistemological account. *The SAGE Handbook of Grounded Theory*, 31-57.

Calogero, R. M., & Pedrotty, K. N. (2004). The practice and process of healthy exercise: an investigation of the treatment of exercise

abuse in women with eating disorders. *Eating Disorders*, *12*(4), 273-291. https://doi.org/10.1080/10640260490521352

Calogero, R., & Pedrotty, K. (2007). Daily practices for mindful exercise. In *low-cost approaches to promote physical and mental health: theory, research, and practice* (pp. 141-160). New York, NY: Springer New York.

Carrard, I., Rothen, S., & Rodgers, R. F. (2020). Body image and disordered eating in older women: a tripartite sociocultural model. *Eating Behaviors*, *38*, 101412. https://doi.org/10.1016/j.eatbeh.2020.101412

Carter, B., & New, C. (2004). 1 Realist social theory and empirical research. In *making realism work: realist social theory and empirical research* (pp. 1-20). Routledge.

Carter, B., & New, C. (2005). Realist social theory and empirical research. In *making realism work* (pp. 1-20). Routledge.

Chantler, I., Szabo, C. P., & Green, K. (2005). Muscular strength changes in hospitalized anorexic patients after an eight-week resistance training program. *International Journal of Sports Medicine*, 660-665. https://doi.org/ 10.1055/s-2005-865812

Charmaz, K. (2014). *Constructing grounded theory*. Sage.

Choe, E. Y., Jorgensen, A., & Sheffield, D. (2020). Does a natural environment enhance the effectiveness of Mindfulness-Based Stress Reduction (MBSR)? Examining the mental health and wellbeing, and nature connectedness benefits. *Landscape and Urban Planning*, *202*, 103886. https://doi.org/10.1016/j.landurbplan.2020.103886

Cook-Cottone, C. (2020). *Embodiment and the treatment of eating disorders: the body as a resource in recovery*. WW Norton & Company.

Cook-Cottone, C. P. (2015). Incorporating positive body image into the treatment of eating disorders: a model for attunement and mindful self-care. *Body Image*, *14*, 158-167. https://doi.org/10.1016/j.bodyim.2015.03.004

Cooper, M. J., Wells, A., & Todd, G. (2004). A cognitive model of bulimia nervosa. *British Journal of Clinical Psychology*, *43*(1), 1-16. https://doi.org/10.1348/014466504772812931

Cooper, P. J., & Fairburn, C. G. (1993). Confusion over the core psychopathology of bulimia nervosa. *International Journal of Eating Disorders*, *13*(4), 385-389. https://doi.org/10.1002/1098-108X(199305)13:4<385::AID-EAT2260130406>3.0.CO;2-W

Cooper, Z., & Fairburn, C. G. (2010). Cognitive behavior therapy for bulimia nervosa. *The Treatment of Eating Disorders: a Clinical Handbook*, 243-270.

Corning, A. F., Krumm, A. J., & Smitham, L. A. (2006). Differential social comparison processes in women with and without eating disorder symptoms. *Journal of Counselling Psychology*, *53*(3), 338. https://doi.org/10.1037/0022-0167.53.3.338

Cosh, S. M., McNeil, D. G., & Tully, P. J. (2023). Compulsive exercise and its relationship with mental health and psychosocial wellbeing in recreational exercisers and athletes. *Journal of Science and Medicine in Sport*. https://doi.org/10.1016/j.jsams.2023.05.006

Crisp, A. H. (1967). The possible significance of some behaviour correlates of weight and carbohydrate intake. *Journal of Psychosomatic Research*. https://doi.org/10.1016/0022-3999(67)90064-5

Cropley, M., Merdian, H., & Smith, S. (2024). *A systematic review and meta-ethnography of the understanding and experience of mind-body connection in individuals with lived experience of eating disorders*. [Manuscript submitted for publication].

Dalle Grave, R., Calugi, S., El Ghoch, M., Conti, M., & Fairburn, C. G. (2014). Inpatient cognitive behavior therapy for adolescents with anorexia nervosa: immediate and longer-term effects. *Frontiers in Psychiatry*, *5*, 14.

Davis, C., & Claridge, G. (1998). The eating disorders as addiction: a psychobiological perspective. *Addictive Behaviors*, *23*(4), 463-475. https://doi.org/10.1016/S0306-4603(98)00009-4

Davis, C., & Fox, J. (1993). Excessive exercise and weight preoccupation in women. *Addictive Behaviors*, *18*(2), 201-211. https://doi.org/10.1016/0306-4603(93)90050-J

DeForge, R., & Shaw, J. (2012). Back-and fore-grounding ontology: exploring the linkages between critical realism, pragmatism, and methodologies in health & rehabilitation sciences. *Nursing Inquiry*, *19*(1), 83-95. https://doi.org/10.1111/j.1440-1800.2011.00550.x

Denzin, N. K., Lincoln, Y. S., & Giardina, M. D. (2006). Disciplining qualitative research. *International Journal of Qualitative Studies in Education*, *19*(6), 769-782. https://doi.org/10.1080/09518390600975990

Deslandes, A., Moraes, H., Ferreira, C., Veiga, H., Silveira, H., Mouta, R., ... & Laks, J. (2009). Exercise and mental health: many reasons to move. *Neuropsychobiology*, *59*(4), 191-198. https://doi.org/10.1159/000223730

Dey, I. (1999). Grounding grounded theory: guidelines for qualitative inquiry.

Dolan, B., Evans, C., & Lacey, J. H. (1992). The natural history of disordered eating behavior and attitudes in adult women. *International Journal of Eating Disorders*, *12*(3), 241-248. https://doi.org/10.1002/1098-108X(199211)12:3<241::AID-EAT2260120303>3.0.CO;2-6

Donovan, C. L., Uhlmann, L. R., & Loxton, N. J. (2020). Strong is the new skinny, but is it ideal?: a test of the tripartite influence model using a new measure of fit-ideal internalisation. *Body Image*, *35*, 171-180. https://doi.org/10.1016/j.bodyim.2020.09.002

Dougherty, E. N., Murphy, J., Hamlett, S., George, R., Badillo, K., Johnson, N. K., & Haedt-Matt, A. A. (2020). Emotion regulation flexibility and disordered eating. *Eating Behaviors*, *39*, 101428. https://doi.org/10.1016/j.eatbeh.2020.101428

Douglass, L. (2009). Yoga as an intervention in the treatment of eating disorders: Does it help? *Eating Disorders: The Journal of Treatment and Prevention*, 17, 126e139. https://doi.org/10.1080/10640260802714555

Duesund, L., & Skårderud, F. (2003). Use the body and forget the body: treating anorexia nervosa with adapted physical activity. *Clinical Child Psychology and Psychiatry*, *8*(1), 53-72. https://doi.org/10.1177/1359104503008001007

Eatough, V., & Smith, J. A. (2017). Interpretative phenomenological analysis. *The Sage Handbook of Qualitative Research in Psychology*, 193-209.

Elbourne, K. E., & Chen, J. (2007). The continuum model of obligatory exercise: a preliminary investigation. *Journal of Psychosomatic Research*, *62*(1), 73-80. https://doi.org/10.1016/j.jpsychores.2004.12.003

Escobar-Roldan, I. D., Babyak, M. A., & Blumenthal, J. A. (2021). Exercise prescription practices to improve mental health. *Journal of Psychiatric Practice®*, *27*(4), 273-282. https://doi.org/10.1097/PRA.0000000000000554

Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. Guilford Press.

Fairburn, C. G., Bailey-Straebler, S., Basden, S., Doll, H. A., Jones, R., Murphy, R., ... & Cooper, Z. (2015). A transdiagnostic comparison of Enhanced Cognitive Behaviour Therapy (CBT-E) and interpersonal psychotherapy in the treatment of eating disorders. *Behaviour Research and Therapy*, *70*, 64-71. https://doi.org/10.1016/j.brat.2015.04.010

Fairburn, C. G., Cooper D Phil, Dip Psych, Z., Doll D Phil, H. A., O'Connor, M. E., Bohn D Phil, Dip Psych, K., Hawker, D. M., ... & Palmer, R. L. (2009). Transdiagnostic cognitive-behavioral therapy for patients with eating disorders: a two-site trial with 60-week follow-up. *American Journal of Psychiatry*, *166*(3), 311-319. https://doi.org/10.1176/appi.ajp.2008.08040608

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and

treatment. *Behaviour Research and Therapy*, *41*(5), 509-528. https://doi.org/10.1016/S0005-7967(02)00088-8

Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Palmer, R. L., & Dalle Grave, R. (2013). Enhanced cognitive behaviour therapy for adults with anorexia nervosa: a UK–Italy study. *Behaviour Research and Therapy*, *51*(1), R2-R8. https://doi.org/10.1016/j.brat.2012.09.010

Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology*, *61*(4), 696. https://doi.org/10.1037/0022-006X.61.4.696

Fassinger, R. E. (2005). Paradigms, praxis, problems, and promise: Grounded theory in counseling psychology research. *Journal of Counseling Psychology*, *52*(2), 156. https://doi.org/10.1037/0022-0167.52.2.156

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117-140. https://doi.org/10.1177/001872675400700202

Festinger, L. (1957). Social comparison theory. *Selective Exposure Theory*, *16*, 401.

Fietz, M., Touyz, S., & Hay, P. (2014). A risk profile of compulsive exercise in adolescents with an eating disorder: a systematic review. *Advances in Eating Disorders: Theory, Research and Practice*, *2*(3), 241-263. https://doi.org/10.1080/21662630.2014.894470

Fitzsimmons-Craft, E. E. (2011). Social psychological theories of disordered eating in college women: review and integration. *Clinical Psychology Review*, *31*(7), 1224-1237. https://doi.org/10.1016/j.cpr.2011.07.011

Flaherty, M. (2014). Influence of yoga on body image satisfaction in men. *Perceptual and Motor Skills*, *119*(1), 203-214. https://doi.org/10.2466/27.50.PMS.119c17z1

Fletcher, A. J. (2017). Applying critical realism in qualitative research: methodology meets method. *International Journal of Social Research Methodology*, *20*(2), 181-194. https://doi.org/10.1080/13645579.2016.1144401

Flett, G. L., & Hewitt, P. L. (2005). The perils of perfectionism in sports and exercise. *Current Directions in Psychological Science*, *14*(1), 14-18. https://doi.org/10.1111/j.0963-7214.2005.00326.x

Fox, F. E., Rodham, K. J., Harris, M. F., Taylor, G. J., Sutton, J., Scott, J., & Robinson, B. (2009). Experiencing "the other side": a study of empathy and empowerment in general practitioners who have been patients. *Qualitative Health Research*, 19(11), 1580–1588. https://doi.org/10.1177/1049732309350732

Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory: toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*(2), 173-206. https://doi.org/10.1111/j.1471-6402.1997.tb00108.x

Fugard, A. J., & Potts, H. W. (2015). Supporting thinking on sample sizes for thematic analyses: a quantitative tool. *International Journal of Social Research Methodology*, *18*(6), 669-684. https://doi.org/10.1080/13645579.2015.1005453

Fusar-Poli, P., de Pablo, G. S., De Micheli, A., Nieman, D. H., Correll, C. U., Kessing, L. V., ... & van Amelsvoort, T. (2020). What is good mental health? A scoping review. *European Neuropsychopharmacology*, *31*, 33-46. https://doi.org/10.1016/j.euroneuro.2019.12.105

Gale, C., Holliday, J., Troop, N. A., Serpell, L., & Treasure, J. (2006). The pros and cons of change in individuals with eating disorders: a broader perspective. *International Journal of Eating Disorders*, *39*(5), 394-403. https://doi.org/10.1002/eat.20250

Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: psychometric features and clinical correlates. *Psychological Medicine*, *12*(4), 871-878. https://doi.org/10.1017/S0033291700049163

Gavin, J., & McBrearty, M. (2006). Exploring mind-body modalities: a revealing review of the latest scientific studies dealing with the psychological benefits of different mindful types of exercise. *IDEA Fitness Journal*, *3*(6), 58-67.

Geller, J., Cockell, S. J., Hewitt, P. L., Goldner, E. M., & Flett, G. L. (2000). Inhibited expression of negative emotions and interpersonal orientation in anorexia nervosa. *International Journal of Eating Disorders*, *28*(1), 8-19. https://doi.org/10.1002/1098-108X(200007)28:1<8::AID-EAT2>3.0.CO;2-U

Gilbert, P. (2019). Psychotherapy for the 21st century: an integrative, evolutionary, contextual, biopsychosocial approach. *Psychology and Psychotherapy: Theory, Research and Practice*, *92*(2), 164-189. https://doi.org.10.1111/papt.12226

Gillman, A. S., & Bryan, A. D. (2020). Mindfulness versus distraction to improve affective response and promote cardiovascular exercise

behavior. *Annals of Behavioral Medicine*, *54*(6), 423-435. https://doi.org/10.1093/abm/kaz059

Glaser, B. G. (1992). Basics of grounded theory analysis: emergence vs forcing. *Forcing, Mill Valley* (1992).

Godoy-Izquierdo, D., Ramírez, M. J., Díaz, I., & López-Mora, C. (2023). A systematic review on exercise addiction and the disordered eating-eating disorders continuum in the competitive sport context. *International Journal of Mental Health and Addiction*, *21*(1), 529-561. https://doi.org/10.1007/s11469-021-00610-2

Goldner, E. M., Srikameswaran, S., Schroeder, M. L., Livesley, W. J., & Birmingham, C. L. (1999). Dimensional assessment of personality pathology in patients with eating disorders. *Psychiatry Research*, *85*(2), 151-159. https://doi.org/10.1016/S0165-1781(98)00145-0

Gordon, R. A. (2017). The history of eating disorders. *Eating Disorders and Obesity: a Comprehensive Handbook*, *3*, 163-168.

Gordon, K. H., Holm-Denoma, J. M., Crosby, R. D., & Wonderlich, S. A. (2010). The classification of eating disorders. *The Oxford Handbook of Eating Disorders*, 9-23.

Gouttebarge, V., Bindra, A., Blauwet, C., Campriani, N., Currie, A., Engebretsen, L., ... & Budgett, R. (2021). International Olympic Committee (IOC) Sport Mental Health Assessment Tool 1 (SMHAT-1) and Sport Mental Health Recognition Tool 1 (SMHRT-1): towards better support of athletes' mental health. *British Journal of Sports Medicine*, *55*(1), 30-37. https://doi.org/10.1136/bjsports-2020-102411

Granieri, A., & Schimmenti, A. (2014). Mind–body splitting and eating disorders: a psychoanalytic perspective. *Psychoanalytic Psychotherapy*, *28*(1), 52-70. https://doi.org/10.1080/02668734.2013.872172

Gray, L. M., Wong-Wylie, G., Rempel, G. R., & Cook, K. (2020). Expanding qualitative research interviewing strategies: zoom video communications. *The Qualitative Report*, *25*(5), 1292-1301.

Gull, W. W. (1874). Anorexia nervosa (apepsia hysterica, anorexia hysterica). *Trans. Clin. Soc., London*, *7*, 22-28.

Halliwell, E., & Harvey, M. (2006). Examination of a sociocultural model of disordered eating among male and female adolescents. *British Journal of Health Psychology*, *11*(2), 235-248. https://doi.org/10.1348/135910705X39214

Hallward, L., Di Marino, A., & Duncan, L. R. (2022). A systematic review of treatment approaches for compulsive exercise among individuals with eating disorders. *Eating Disorders*, *30*(4), 411-436. https://doi.org/10.1080/10640266.2021.1895509

Halmi, K. A. (2004). Obsessive-compulsive personality disorder and eating disorders. *Eating Disorders*, *13*(1), 85-92. https://doi.org/10.1080/10640260590893683

Halmi, K. A., Sunday, S. R., Strober, M., Kaplan, A., Woodside, D. B., Fichter, M., ... & Kaye, W. H. (2000). Perfectionism in anorexia nervosa: variation by clinical subtype, obsessionality, and pathological eating behavior. *American Journal of Psychiatry*, *157*(11), 1799-1805. https://doi.org/10.1176/appi.ajp.157.11.1799

Hamama-Raz, Y., Nativ, S., & Hamama, L. (2021). Post-traumatic growth in inflammatory bowel disease patients: the role of illness cognitions and physical quality of life. *Journal of Crohn's and Colitis*, *15*(6), 1060-1067. https://doi.org/10.1093/ecco-jcc/jjaa247

Hausenblas, H. A., Cook, B. J., & Chittester, N. I. (2008). Can exercise treat eating disorders?. *Exercise and Sport Sciences Reviews*, *36*(1), 43-47. https://doi.org/10.1097/jes.0b013e31815e4040

Hawkins Elder, H. (2021). *The explanation of disordered eating: a metatheoretical approach* (Doctoral dissertation, Open Access Te Herenga Waka-Victoria University of Wellington).

Hay, P., Touyz, S., Arcelus, J., Pike, K., Attia, E., Crosby, R. D., ... & Meyer, C. (2018). A randomized controlled trial of the compuLsive Exercise Activity TheraPy (LEAP): A new approach to compulsive exercise in anorexia nervosa. *International Journal of Eating Disorders*, *51*(8), 999-1004. https://doi.org/10.1002/eat.22920

Herbert, C., Meixner, F., Wiebking, C., & Gilg, V. (2020). Regular physical activity, short-term exercise, mental health, and well-being among university students: the results of an online and a laboratory study. *Frontiers in Psychology*, *11*, 509. https://doi.org/10.3389/fpsyg.2020.00509

Herman, C. P., & Polivy, J. (2004). The self-regulation of eating. *Handbook of Self-Regulation*, 492-508.

Hockin-Boyers, H., & Warin, M. (2021). Women, exercise, and eating disorder recovery: the normal and the pathological. *Qualitative Health Research*, *31*(6), 1029-1042. https://doi.org/10.1177/1049732321992042

Hodge, B. (2017). Discourse analysis. In *The Routledge Handbook of Systemic Functional Linguistics* (pp. 544-556). Routledge.

Hoiles, K. J., Egan, S. J., & Kane, R. T. (2012). The validity of the transdiagnostic cognitive behavioural model of eating disorders in predicting dietary restraint. *Eating Behaviors*, *13*(2), 123-126. https://doi.org/10.1016/j.eatbeh.2011.11.007

Hoiles, K. J., Egan, S. J., & Kane, R. T. (2012). The validity of the transdiagnostic cognitive behavioural model of eating disorders in predicting dietary restraint. *Eating Behaviors*, *13*(2), 123-126. https://doi.org/10.1016/j.eatbeh.2011.11.007

Holland, G., & Tiggemann, M. (2017). "Strong beats skinny every time": disordered eating and compulsive exercise in women who post fitspiration on Instagram. *International Journal of Eating Disorders*, *50*(1), 76-79. https://doi.org/10.1002/eat.22559

Ivanova, I. V., Tasca, G. A., Hammond, N., Balfour, L., Ritchie, K., Koszycki, D., & Bissada, H. (2015). Negative affect mediates the relationship between interpersonal problems and binge-eating disorder symptoms and psychopathology in a clinical sample: a test of the interpersonal model. *European Eating Disorders Review*, *23*(2), 133-138. https://doi.org/10.1002/erv.2344

Ives, J. C., & Sosnoff, J. (2000). Beyond the mind-body exercise hype. *The Physician and Sports Medicine*, *28*(3), 67-81. https://doi.org/10.3810/psm.2000.03.776

Johnstone, L., & Dallos, R. (2013). Introduction to formulation. In *Formulation in Psychology and Psychotherapy* (pp. 1-17). Routledge.

Kakar, V., Fardouly, J., Rapee, R. M., Guo, M., Arman, S., & Niazi, E. (2023). Exploring the tripartite influence model of body image and disordered eating among adolescent girls living in Australia, China, India, and Iran. *Body Image*, *47*, 101633. https://doi.org/10.1016/j.bodyim.2023.101633

Kaye, W. H., Weltzin, T., & Hsu, L. G. (1993). Relationship between anorexia nervosa and obsessive and compulsive behaviors. *Psychiatric Annals*, *23*(7), 365-373. https://doi.org/10.3928/0048-5713-19930701-07

Keery, H., Van den Berg, P., & Thompson, J. K. (2004). An evaluation of the tripartite influence model of body dissatisfaction and eating disturbance with adolescent girls. *Body Image*, *1*(3), 237-251. https://doi.org/10.1016/j.bodyim.2004.03.001

Keski-Rahkonen, A. (2001). Exercise dependence–a myth or a real issue?. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *9*(4), 279-283. https://doi.org/10.1002/erv.429

Koch, S. C., Glawe, S., & Holt, D. V. (2011). Up and down, front and back. *Social Psychology*. https://doi.org/10.1027/1864-9335/a000065

Kramer, A. (2020). An overview of the beneficial effects of exercise on health and performance. *Physical Exercise for Human Health*, 3-22.

Lampard, A. M., Tasca, G. A., Balfour, L., & Bissada, H. (2013). An evaluation of the transdiagnostic cognitive-behavioural model of eating disorders. *European Eating Disorders Review*, *21*(2), 99-107. https://doi.org/10.1002/erv.2214

Lawson, R., Waller, G., & Lockwood, R. (2007). Cognitive content and process in eating-disordered patients with obsessive–compulsive features. *Eating Behaviors*, *8*(3), 305-310. https://doi.org/10.1016/j.eatbeh.2006.11.006

Leuenberger, A. (2006). Endorphins, exercise, and addictions: a review of exercise dependence. *The Premier Journal for Undergraduate Publications in the Neurosciences*, *3*(1).

Levitt, H. M., Motulsky, S. L., Wertz, F. J., Morrow, S. L., & Ponterotto, J. G. (2017). Recommendations for designing and reviewing qualitative research in psychology: promoting methodological integrity. *Qualitative Psychology*, *4*(1), 2. https://doi.org/10.1037/qup0000082

Littrell, J. (2008). The mind-body connection: not just a theory anymore. *Social Work in Health Care*, *46*(4), 17-37. https://doi.org/10.1300/J010v46n04_02

Long, C. G. (1995). Assessment and management of eating disordered patients who over-exercise: a four-year follow-up of six single case studies. *Journal of Mental Health*, *4*(3), 309-316. https://doi.org/10.1080/09638239550037604

Lose, A., Davies, C., Renwick, B., Kenyon, M., Treasure, J., Schmidt, U., & MOSAIC Trial Group. (2014). Process evaluation of the Maudsley model for treatment of adults with anorexia nervosa trial. Part II: patient experiences of two psychological therapies for treatment of anorexia nervosa. *European Eating Disorders Review*, *22*(2), 131-139. https://doi.org/10.1002/erv.2279

Low, J. (2019). A pragmatic definition of the concept of theoretical saturation. *Sociological Focus*, *52*(2), 131-139. https://doi.org/10.1080/00380237.2018.1544514

Lund, T. (2005). The qualitative–quantitative distinction: some comments. *Scandinavian Journal of Educational Research*, *49*(2), 115-132. https://doi.org/10.1080/00313830500048790

Madill, A., Jordan, A., & Shirley, C. (2000). Objectivity and reliability in qualitative analysis: realist, contextualist and radical constructionist epistemologies. *British Journal of Psychology*, *91*(1), 1-20. https://doi.org/10.1348/000712600161646

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: guided by information power. *Qualitative Health Research*, *26*(13), 1753-1760. https://doi.org/10.1177/1049732315617444

Mancine, R. P., Gusfa, D. W., Moshrefi, A., & Kennedy, S. F. (2020). Prevalence of disordered eating in athletes categorized by emphasis on leanness and activity type–a systematic review. *Journal of Eating Disorders*, *8*(1), 1-9. https://doi.org/10.1186/s40337-020-00323-2

Mancini, F., & Gangemi, A. (2006). The role of responsibility and fear of guilt in hypothesis-testing. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*(4), 333-346. https://doi.org/10.1016/j.jbtep.2006.03.004

Marsh, S. (2015*). Hunger, hope, and healing: a yoga approach to reclaiming your relationship to your body and food*. Boston, MA. Shambhala Publications.

Martenstyn, J. A., Aouad, P., Touyz, S., & Maguire, S. (2022). Treatment of compulsive exercise in eating disorders and muscle dysmorphia: a systematic review and meta-analysis. *Clinical Psychology:*

Science and Practice, *29*(2), 143. https://doi.org/10.1037/cps0000064

McCabe, G. (2008). Mind, body, emotions and spirit: reaching to the ancestors for healing. *Counselling Psychology Quarterly*, *21*(2), 143-152. https://doi.org/10.1080/09515070802066847

Meier, B. P., Schnall, S., Schwarz, N., & Bargh, J. A. (2012). Embodiment in social psychology. *Topics in Cognitive Science*, *4*(4), 705-716. https://doi.org/10.1111/j.1756-8765.2012.01212.x

Meyer, C., & Taranis, L. (2011). Exercise in the eating disorders: terms and definitions. *European Eating Disorders Review, 19*(3), 169–173. https://doi.org/10.1002/erv.1121

Meyer, C., Taranis, L., Goodwin, H., & Haycraft, E. (2011). Compulsive exercise and eating disorders. *European Eating Disorders Review*, *19*(3), 174-189.

Mitchison, D., Hay, P., Slewa-Younan, S., & Mond, J. (2014). The changing demographic profile of eating disorder behaviors in the community. *BMC Public Health*, *14*(1), 1-9. https://doi.org/10.1186/1471-2458-14-943

Modica, C. A., & DiLillo, V. (2023). A structural invariance analysis of the acceptance model of intuitive eating across black, Hispanic, and white young-adult women. *Body Image*, *44*, 157-169. https://doi.org/10.1016/j.bodyim.2022.12.009

Mond, J. M., & Calogero, R. M. (2009). Excessive exercise in eating disorder patients and in healthy women. *Australian & New Zealand Journal of Psychiatry*, *43*(3), 227-234. https://doi.org/10.1080/00048670802653323

Mond, J. M., Hay, P. J., Rodgers, B., Owen, C., & Beumont, P. J. (2004). Validity of the Eating Disorder Examination Questionnaire (EDE-Q) in screening for eating disorders in community samples. *Behaviour Research and Therapy*, *42*(5), 551-567. https://doi.org/10.1016/S0005-7967(03)00161-X

Monell, E., Meyer, C., Szwajda, A., & Forsén Mantilla, E. (2021). Taking the LEAP: study protocol for a randomized, multicentre, naturalistic, efficacy trial of the compuLsive Exercise Activity theraPy (LEAP)-a cognitive behavioral program specifically targeting compulsive exercise in patients with eating disorders. *BMC Psychiatry*, *21*, 1-11. https://doi.org/10.1186/s12888-021-03356-2

Moola, F. J., Gairdner, S. E., & Amara, C. E. (2013). Exercise in the care of patients with anorexia nervosa: a systematic review of the literature. *Mental Health and Physical Activity*, *6*(2), 59-68. https://doi.org/10.1016/j.mhpa.2013.04.002

Moradi, B. (2011). Objectification theory: areas of promise and refinement. *The Counseling Psychologist*, *39*(1), 153-163. https://doi.org/10.1177/0011000010384279

Morton, R. *Phthisiologica-or Treatise of Consumption*. London: Smith and Walford, 1694.

Murray, S. B., Blashill, A. J., & Calzo, J. P. (2022). Prevalence of disordered eating and associations with sex, pubertal maturation, and weight in children in the US. *JAMA paediatrics*, *176*(10), 1039-1040. https://doi.org/10.1001/jamapediatrics.2022.2490

Myszko, O., Torga, A. P., Lawrence, D., & Rosenthal, L. A. (2023). Exploring the mind-body connection from puberty to the interSEXtion of eating disorders and reproductive health: what

mental health providers should know. *Bulletin of the Menninger Clinic*, *87*(2), 135-161. https://doi.org/10.1521/bumc.2023.87.2.135

Nelson, J. (2017). Using conceptual depth criteria: addressing the challenge of reaching saturation in qualitative research. *Qualitative Research*, *17*(5), 554-570. https://doi.org/10.1177/1468794116679873

Neumark-Sztainer, D., Wall, M. M., Story, M., & Perry, C. L. (2003). Correlates of unhealthy weight-control behaviors among adolescents: implications for prevention programs. *Health Psychology*, *22*(1), 88. https://doi.org/10.1037/0278-6133.22.1.88

NHS. (2024). NHS choices. https://www.nhs.uk/live-well/exercise/

Nielsen, K., & Ward, T. (2020). Mental disorder as both natural and normative: developing the normative dimension of the 3e conceptual framework for psychopathology. *Journal of Theoretical and Philosophical Psychology*, *40*(2), 107. https://doi.org/10.1037/teo0000118

Nordbø, R. H., Espeset, E. M., Gulliksen, K. S., Skårderud, F., & Holte, A. (2006). The meaning of self-starvation: qualitative study of patients' perception of anorexia nervosa. *International Journal of Eating Disorders*, *39*(7), 556-564. https://doi.org/10.1002/eat.20276

Nummenmaa, L., Glerean, E., Hari, R., & Hietanen, J. K. (2014). Bodily maps of emotions. *Proceedings of the National Academy of Sciences*, *111*(2), 646-651. https://doi.org/10.1073/pnas.1321664111

Oh, K. H., Wiseman, M. C., Hendrickson, J., Phillips, J. C., & Hayden, E. W. (2012). Testing the acceptance model of intuitive eating with college women athletes. *Psychology of Women Quarterly*, *36*(1), 88-98. https://doi.org/10.1177/03616843114332

Oldershaw, A., Startup, H., & Lavender, T. (2019). Anorexia nervosa and a lost emotional self: a psychological formulation of the development, maintenance, and treatment of anorexia nervosa. *Frontiers in Psychology*, *10*, 219. https://doi.org/10.3389/fpsyg.2019.00219

Ortlipp, M. (2015). Keeping and using reflective journals in the qualitative research process. *Qualitative Report*. https://doi.org/10.46743/2160-3715/2008.1579

Oxford English Dictionary. (2024) *reference l.1.* Oxford: Oxford University. [Online] [Accessed on 29th July 2024]. https://www.oed.com/dictionary/body_n?tab=meaning_and_use#17169605

Park, C. (2013). Mind-body CAM interventions: current status and considerations for integration into clinical health psychology. *Journal of Clinical Psychology*, *69*(1), 45-63. https://doi.org/10.1002/jclp.21910

Patel, N., & Pilgrim, D. (2018). Psychologists and torture: critical realism as a resource for analysis and training. *Journal of Critical Realism*, *17*(2), 176-191. https://doi.org/10.1080/14767430.2018.1430975

Pennesi, J. L., & Wade, T. D. (2016). A systematic review of the existing models of disordered eating: do they inform the development of

effective interventions?. *Clinical Psychology Review*, *43*, 175-192. https://doi.org/10.1016/j.cpr.2015.12.004

Pereira, R. F., & Alvarenga, M. (2007). Disordered eating: identifying, treating, preventing, and differentiating it from eating disorders. *Diabetes Spectrum*, *20*(3), 141-148. https://doi.org/10.2337/diaspect.20.3.141

Polivy, J., Herman, C. P., Mills, J. S., & Wheeler, H. B. (2006). Eating disorders in adolescence. *Blackwell Handbook of Adolescence*, 523-549.

Ponterotto, J. G. (2005). Qualitative research in counseling psychology: a primer on research paradigms and philosophy of science. *Journal of Counseling Psychology*, *52*(2), 126. https://doi.org/10.1037/0022-0167.52.2.126

Portela-Pino, I., López-Castedo, A., Martínez-Patiño, M. J., Valverde-Esteve, T., & Domínguez-Alonso, J. (2020). Gender differences in motivation and barriers for the practice of physical exercise in adolescence. *International Journal of Environmental Research and Public Health*, *17*(1), 168. https://doi.org/10.3390/ijerph17010168

Potter, J., & Hepburn, A. (2005). Qualitative interviews in psychology: problems and possibilities. *Qualitative Research in Psychology*, *2*(4), 281-307. https://doi.org/10.1191/1478088705qp045oa

Poulsen, S., Lunn, S., Daniel, S. I., Folke, S., Mathiesen, B. B., Katznelson, H., & Fairburn, C. G. (2014). A randomized controlled trial of psychoanalytic psychotherapy or cognitive-behavioral therapy for bulimia nervosa. *American Journal of*

Psychiatry, *171*(1), 109-116. https://doi.org/10.1176/appi.ajp.2013.12121511

Price, C. J., & Thompson, E. (2007). Scale of Body Connection (SBC). *Retrieved from Journal of Alternative and Complementary Medicine*, *13*(9), 945-954. https://doi.org/10.1037/t71163-000

Pritchard, B. J., Bergin, J. L., & Wade, T. D. (2004). A case series evaluation of guided self-help for bulimia nervosa using a cognitive manual. *International Journal of Eating Disorders*, *36*(2), 144-156. https://doi.org/10.1002/eat.20037

Provencher, V., Bégin, C., Tremblay, A., Mongeau, L., Boivin, S., & Lemieux, S. (2007). Short-term effects of a "health-at-every-size" approach on eating behaviors and appetite ratings. *Obesity*, *15*(4), 957-966. https://doi.org/10.1038/oby.2007.638

Reiner, P. B., & Nagel, S. K. (2017). Technologies of the extended mind: defining the issues. *Neuroethics: Anticipating the Future*, 108-122.

Rigaud, D., Pennacchio, H., Bizeul, C., Reveillard, V., & Vergès, B. (2011). Outcome in AN adult patients: a 13-year follow-up in 484 patients. *Diabetes & Metabolism*, *37*(4), 305-311. https://doi.org/10.1016/j.diabet.2010.11.020

Roach, A., & Tadesse, R. (2023). "It is ok not to be ok": nursing students' backgrounds and perceptions of mental health stigma and implications for mental health nursing education. *Issues in Mental Health Nursing*, *44*(10), 1050-1058. https://doi.org/10.1080/01612840.2023.2265470

Roffe, J. H. (2017). *The experience of compulsive exercise in individuals with an eating disorder: an interpretative phenomenological analysis* (Doctoral dissertation, University of Leicester).

Sandelowski, M. (1995). Sample size in qualitative research. *Research in Nursing & Health*, *18*(2), 179-183. https://doi.org/10.1002/nur.4770180211

Sbaraini, A., Carter, S. M., Evans, R. W., & Blinkhorn, A. (2011). How to do a grounded theory study: a worked example of a study of dental practices. *BMC Medical Research Methodology*, *11*, 1-10. https://doi.org/10.1186/1471-2288-11-128

Scharmer, C., Gorrell, S., Schaumberg, K., & Anderson, D. (2020). Compulsive exercise or exercise dependence? Clarifying conceptualizations of exercise in the context of eating disorder pathology. *Psychology of Sport and Exercise*, *46*, 101586. https://doi.org/10.1016/j.psychsport.2019.101586

Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology*, *45*(3), 343-366. https://doi.org/10.1348/014466505X53902

Schmidt, U., Renwick, B., Lose, A., Kenyon, M., DeJong, H., Broadbent, H., ... & Landau, S. (2013). The MOSAIC study-comparison of the Maudsley Model of Treatment for Adults with Anorexia Nervosa (MANTRA) with Specialist Supportive Clinical Management (SSCM) in outpatients with anorexia nervosa or eating disorder not otherwise specified, anorexia nervosa type: study protocol for a randomized controlled trial. *Trials*, *14*(1), 1-10. https://doi.org/10.1186/1745-6215-14-160

Schmidt, U., Wade, T. D., & Treasure, J. (2014). The Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA): development, key features, and preliminary evidence. *Journal of Cognitive Psychotherapy*, *28*(1). https://doi.org/ 10.1891/0889-8391.28.1.48

Shapiro, L. (2020). *The somatic therapy workbook: stress-relieving exercises for strengthening the mind-body connection and sparking emotional and physical healing*. Ulysses Press.

Shroff, H., Reba, L., Thornton, L. M., Tozzi, F., Klump, K. L., Berrettini, W. H., ... & Bulik, C. M. (2006). Features associated with excessive exercise in women with eating disorders. I*nternational Journal of Eating Disorders*, *39*(6), 454-461. https://doi.org/10.1002/eat.20247

Siegel, D. J. (2019). The mind in psychotherapy: an interpersonal neurobiology framework for understanding and cultivating mental health. *Psychology and Psychotherapy: Theory, Research and Practice*, *92*(2), 224-237. https://doi/org/10.1111/papt/12228

Slater, J., Treasure, J., Schmidt, U., Gilchrist, P., & Wade, T. D. (2015). A pilot study of associations between treatment for anorexia nervosa and carers' distress. *Clinical Psychology & Psychotherapy*, *22*(4), 372-376. https://doi.org/10.1002/cpp.1895

Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. *Health Psychology Review*, *5*(1), 9-27. https://doi.org/10.1080/17437199.2010.510659

Solenberger, S. E. (2001). Exercise and eating disorders: a 3-year inpatient hospital record analysis. *Eating Behaviors*, *2*(2), 151-168. https://doi.org/10.1016/S1471-0153(01)00026-5

Spitzack, C. (1990). *Confessing excess: women and the politics of body reduction*. State University of New York Press.

Staley, K., Kabir, T., & Szmukler, G. (2013). Service users as collaborators in mental health research: less stick, more carrot. *Psychological Medicine*, 43(6), 1121–1125. https://doi.org/10.1017/S0033291712001663

Stice, E. (1994). Review of the evidence for a sociocultural model of bulimia nervosa and an exploration of the mechanisms of action. *Clinical Psychology Review*, *14*(7), 633-661. https://doi.org/10.1016/0272-7358(94)90002-7

Stice, E., Marti, C. N., Rohde, P., & Shaw, H. (2011). Testing mediators hypothesized to account for the effects of a dissonance-based eating disorder prevention program over longer term follow-up. *Journal of Consulting and Clinical Psychology*, *79*(3), 398. https://doi.org/10.1037/a0023321

Stice, E., Rohde, P., Gau, J., & Shaw, H. (2009). An effectiveness trial of a dissonance-based eating disorder prevention program for high-risk adolescent girls. *Journal of Consulting and Clinical Psychology*, *77*(5), 825. https://doi.org/10.1037/a0016132

Strahan, E. J., Wilson, A. E., Cressman, K. E., & Buote, V. M. (2006). Comparing to perfection: how cultural norms for appearance affect

social comparisons and self-image. *Body Image*, *3*(3), 211-227. https://doi.org/10.1016/j.bodyim.2006.07.004

Striegel-Moore, R. H., & Cachelin, F. M. (2001). Etiology of eating disorders in women. *The Counseling Psychologist*, *29*(5), 635-661. https://doi.org/10.1177/0011000001295002

Swim, J. K., Hyers, L. L., Cohen, L. L., & Ferguson, M. J. (2001). Everyday sexism: evidence for its incidence, nature, and psychological impact from three daily diary studies. *Journal of Social Issues*, *57*(1), 31-53. https://doi.org/10.1111/0022-4537.00200

Sypeck, M. F., Gray, J. J., & Ahrens, A. H. (2004). No longer just a pretty face: fashion magazines' depictions of ideal female beauty from 1959 to 1999. *International Journal of Eating Disorders*, *36*(3), 342-347. https://doi.org/10.1002/eat.20039

Tanofsky-Kraff, M., & Yanovski, S. Z. (2004). Eating disorder or disordered eating? Non-normative eating patterns in obese individuals. *Obesity research*, *12*(9), 1361-1366. https://doi.org/10.1038/oby.2004.171

Taranis, L., Touyz, S., & Meyer, C. (2011). Disordered eating and exercise: development and preliminary validation of the Compulsive Exercise Test (CET). *European Eating Disorders Review*, *19*(3), 256-268. https://doi.org/10.1002/erv.1108

Taranis, L., Touyz, S., La Puma, M., & Meyer, C. (2011). Loughborough eating-disorders activity programme "LEAP" group cognitive-behavioural therapy for compulsive exercise in the eating disorders: therapist manual. *Loughborough University*.

Thomas, J. J., Schwartz, M. B., & Brownell, K. D. (2010). Vulnerability to eating disorders in adulthood. *Vulnerability to Psychopathology. Risk Across the Lifespan,* 468-469.

Thornberg, R., Perhamus, L., & Charmaz, K. (2014). Grounded theory. *Handbook of Research Methods in Early Childhood Education: Research Methodologies*, *1*, 405-439.

Treasure, J., & Schmidt, U. (2013). The cognitive-interpersonal maintenance model of anorexia nervosa revisited: a summary of the evidence for cognitive, socio-emotional and interpersonal predisposing and perpetuating factors. *Journal of Eating Disorders*, *1*, 1-10. https://doi.org/10.1186/2050-2974-1-13

Treasure, J., Willmott, D., Ambwani, S., Cardi, V., Clark Bryan, D., Rowlands, K., & Schmidt, U. (2020). Cognitive interpersonal model for anorexia nervosa revisited: the perpetuating factors that contribute to the development of the severe and enduring illness. *Journal of Clinical Medicine*, *9*(3), 630. https://doi.org/10.3390/jcm9030630

Tribole, E., & Resch, E. (2020). *Intuitive eating: a revolutionary anti-diet approach*. St. Martin's Essentials.

Tylka, T. L. (2011). Refinement of the tripartite influence model for men: dual body image pathways to body change behaviors. *Body Image*, *8*(3), 199-207. https://doi.org/10.1016/j.bodyim.2011.04.008

Tylka, T. L., & Andorka, M. J. (2012). Support for an expanded tripartite influence model with gay men. *Body Image*, *9*(1), 57-67. https://doi.org/10.1016/j.bodyim.2011.09.006

Tylka, T. L., & Homan, K. J. (2015). Exercise motives and positive body image in physically active college women and men: Exploring an expanded acceptance model of intuitive eating. *Body Image*, *15*, 90-97. https://doi.org/10.1016/j.bodyim.2015.07.003

Tylka, T. L., & Subich, L. M. (2004). Examining a multidimensional model of eating disorder symptomatology among college women. *Journal of Counseling Psychology*, *51*(3), 314. https://doi.org/10.1037/0022-0167.51.3.314

Tzoneva, M., Forney, K. J., & Keel, P. K. (2015). The influence of gender and age on the association between "fat-talk" and disordered eating: an examination in men and women from their 20s to their 50s. *Eating Disorders*, *23*(5), 439-454. https://doi.org/10.1080/10640266.2015.1013396

Vall, E., & Wade, T. D. (2015). Predictors of treatment outcome in individuals with eating disorders: a systematic review and meta-analysis. *International Journal of Eating Disorders*, *48*(7), 946-971. https://doi.org/10.1002/eat.22411

Van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coovert, M. (2002). The tripartite influence model of body image and eating disturbance: a covariance structure modelling investigation testing the mediational role of appearance comparison. *Journal of Psychosomatic Research*, *53*(5), 1007-1020. https://doi.org/10.1016/S0022-3999(02)00499-3

Van Dyke, N., & Drinkwater, E. J. (2014). Review article relationships between intuitive eating and health indicators: literature review. *Public Health Nutrition*, *17*(8), 1757-1766. https://doi.org/10.1017/S1368980013002139

Wade, T. D., Treasure, J., & Schmidt, U. (2011). A case series evaluation of the Maudsley Model for treatment of adults with anorexia nervosa. *European Eating Disorders Review*, *19*(5), 382-389. https://doi.org/10.1002/erv.1078

Wildes, J. E., & Marcus, M. D. (2011). Development of emotion acceptance behavior therapy for anorexia nervosa: a case series. *International Journal of Eating Disorders*, *44*(5), 421-427. https://doi.org/10.1002/eat.20826

Wildes, J. E., Marcus, M. D., Cheng, Y., McCabe, E. B., & Gaskill, J. A. (2014). Emotion acceptance behavior therapy for anorexia nervosa: a pilot study. *International Journal of Eating Disorders*, *47*(8), 870-873. https://doi.org/10.1002/eat.22241

Wildes, J. E., Ringham, R. M., & Marcus, M. D. (2010). Emotion avoidance in patients with anorexia nervosa: initial test of a functional model. *International Journal of Eating Disorders*, *43*(5), 398-404. https://doi.org/10.1002/eat.20730

Wilfley, D. E., Welch, R. R., Stein, R. I., Spurrell, E. B., Cohen, L. R., Saelens, B. E., ... & Matt, G. E. (2002). A randomized comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Archives of General Psychiatry*, *59*(8), 713-721.

Willig, C. (2016). Constructivism and 'the real world': can they co-exist? *QMiP Bulletin*, (21).

Wilson, G. T., Wilfley, D. E., Agras, W. S., & Bryson, S. W. (2010). Psychological treatments of binge eating disorder. *Archives of General Psychiatry*, *67*(1), 94-101. https://doi.org/10.1001/archgenpsychiatry.2009.170

Wyer, K. (2001). Mirror image: Yoga classes at the Monte Nido clinic are changing how women with eating disorders see themselves. *Yoga Journal*, *158*(2001), 70-73.

Yager, J., Devlin, M. J., Halmi, K. A., Herzog, D. B., Mitchell III, J. E., Powers, P., & Zerbe, K. J. (2014). Guideline watch (August 2012): practice guideline for the treatment of patients with eating disorders. *Focus*, *12*(4), 416-431. https://doi.org/10.1176/appi.focus.120404

Yamamiya, Y., Shroff, H., & Thompson, J. K. (2008). The tripartite influence model of body image and eating disturbance: a replication with a Japanese sample. *International Journal of Eating Disorders*, *41*(1), 88-91. https://doi.org/10.1002/eat.20444

Zunker, C., Mitchell, J. E., & Wonderlich, S. A. (2011). Exercise interventions for women with anorexia nervosa: a review of the literature. *International Journal of Eating Disorders*, *44*(7), 579-584. https://doi.org/10.1002/eat.20862

Appendices

Appendix A *Ethical Approval Letter*

DPAP Committee

10/11/2022

Supervisor: Danielle De Boos

Applicant : Maisie Cropley

Project: 2993Disordered Eating and Relationship with Exercise in Recovery

The committee is pleased to confirm that the above study now has approval on the basis of your application and any subsequent clarifications. You must conduct your research as described in your application, adhere to all conditions under which the ethical approval is granted, and use only materials and documentation specified in your application.

If you need to make any changes (for example to extend your data collection timeframe, change the mode of data collection, or the measures being used), you must create and submit an Amendment Form. To do this, select the 'Create Sub Form' option from the Actions Menu on the left-hand side of the page in the online system and then select 'Amendment Form'.

With best wishes

Dr Jen Yates

Chair of the DPAP Ethics Subcommittee

Appendix B *Study Consent Form*

CONSENT FORM

University of Nottingham
UK | CHINA | MALAYSIA

Version 2

Title of Study: "Individuals' lived experience of their relationship with exercise and mind-body connection in recovery from disordered eating"

Name of Researcher: Maisie Cropley

Please initial box

Name of Participant:

1. I confirm that I have read and understand the information sheet version number 2 dated 24/11/22 for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my legal rights being affected. I understand that should I withdraw more than a week after participation then the information collected so far cannot be erased and that this information may still be used in the project analysis. ☐

3. I understand that relevant data collected in the study may be looked at by authorised individuals from the University of Nottingham, the research group, and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential. ☐

4. I understand that the interview data will be audio transcribed using Microsoft Teams automated transcription and that anonymous direct quotes from the interview may be used in the study reports. ☐

5. I understand that the information collected about me will be used to support other research in the future and may be shared anonymously with other researchers. ☐

6. I agree to take part in the above study. ☐

Name of Participant: Date: Signature:

If you would like to receive a summary of the findings from this study, please leave details with your preferred method of contact for these:

Name of Person taking consent: Maisie Cropley
Date: Signature:

Further information and contact details:
Maisie Cropley, Maisie.cropley@nottingham.ac.uk

Department of Clinical Psychology
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

Supervised by: Dr Sharron Smith, shsmith@lincoln.ac.uk and Dr Hannah Merdian, hmerdian@lincoln.ac.uk

College of Social Science
University of Lincoln
Brayford Pool
Lincoln
Lincolnshire
LN6 7TS

2 copies: 1 for participant and 1 for the project notes

Appendix C *Participant Information Sheet*

Participant Information Sheet
Version 2

Title of Study: "Individuals lived experience of their relationship with exercise and mind-body connection in recovery from disordered eating"

Name of Chief Investigator: Maisie Cropley
Supervisors: Dr Sharron Smith, Dr Hannah Merdian

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?
The purpose of this study is to further our understanding of your lived experience of your relationship with exercise, the mind-body connection in recovery from disordered eating, and the experiences of others in recovery from disordered eating.

Why have I been invited?
You are being invited to take part because you contacted the researcher following seeing our study advert online. We are inviting 15 participants to take part who have responded to the study advert.

Do I have to take part?
It is up to you whether you wish to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. This would not affect your legal rights. However, the data collected already may not be able to be erased and may still be used in the study publication.

What will happen to me if I take part?
You will be invited to an interview with the researcher, Maisie, via Microsoft Teams. This interview is expected to last no more than an hour and will involve questions about your relationship with exercise and mind-body connection. You are free to answer the questions in as much or as

little detail as you choose. The interview will be audio transcribed using the automated Microsoft Teams audio transcription during the interview, this will then be used to contribute to the findings of the study.

Expenses and payments
You will receive a £10 Amazon voucher as thanks for participating in the interview.

What are the possible disadvantages and risks of taking part?
It is not expected that taking part will cause any risks to yourself, however you may find discussing your relationship with exercise and mind-body connection uncomfortable and potentially triggering. As stated, you are free to withdraw at any time during the interview if you do not wish to proceed and can answer questions in as much or little detail as you like and can choose not to answer a question. At the end of the interview, you will be given the contact details of local support services if you would like support for disordered eating, your relationship with exercise or your general wellbeing.

What are the possible benefits of taking part?
We cannot promise the study will help you but the information we get from this study may help to inform future treatment and support for those with disordered eating.

What happens when the research study stops?
When the research ends, and the data has been analysed if you have opted in to be contacted with the results these will be shared with you via your chosen method (the ability to do this is at the end of this information sheet).

An electronic copy of the data will be stored on the secure network within the University of Nottingham. In compliance with the Good Clinical Practice guidelines, regulations and in accordance with the University of Nottingham Code of Research Conduct and Research Ethics, the Chief or local Principal Investigator will maintain all records and documents regarding the conduct of the study. These will be retained for a maximum of 7 years.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. The researchers' contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do this by contacting the Division of Psychiatry and Applied Psychology Research Ethics Committee at MS-DRAPEthics@exmail.nottingham.ac.uk.

In the event that something does go wrong, and you are harmed during the research, and this is due to someone's negligence then you may have grounds for a legal action for compensation against the University of Nottingham, but you may have to pay your legal costs.

Will my taking part in the study be kept confidential?
We will follow ethical and legal practice and all information about you will be handled in confidence.

If you join the study, we will use information collected from you during the course of the research. This information will be kept **strictly confidential**, stored in a secure and locked office, and on a password protected database at the University of Nottingham. Under UK Data Protection laws, the University is the Data Controller (legally responsible for the data security), and the Chief Investigator of this study (named above) is the Data Custodian (manages access to the data). This means we are responsible for looking after your information and using it properly. Your rights to access, change or move your information are limited as we need to manage your information in specific ways to comply with certain laws and for the research to be reliable and accurate. To safeguard your rights, we will use the minimum personally identifiable information possible. The personally identifiable information we will collect will be your gender, age, and nationality.

You can find out more about how we use your information and to read our privacy notice at:

https://www.nottingham.ac.uk/utilities/privacy.aspx.

The data collected for the study will be looked at and stored by authorised persons from the University of Nottingham who are organising the research. They may also be looked at by authorised people from regulatory organisations to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

All research data will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team given permission by the data custodian will have access to your personal data.

In accordance with the University of Nottingham's, the Government's and our funders' policies we may share our research data with researchers in other Universities and organisations, including those in other countries, for research in health and social care. Sharing research data is important to allow peer scrutiny, re-use (and therefore avoiding duplication of

research) and to understand the bigger picture in particular areas of research. Data sharing in this way is usually anonymised (so that you could not be identified) but if we need to share identifiable information, we will seek your consent for this and ensure it is secure. You will be made aware then if the data is to be shared with countries whose data protection laws differ to those of the UK and how we will protect your confidentiality.

Although what you say to us is confidential, should you disclose anything to us which we feel puts you or anyone else at any risk, we may feel it necessary to report this to the appropriate persons, but this will be discussed with you before any action is taken.

What will happen if I don't want to carry on with the study?
Your participation is voluntary, and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. If you withdraw up to the submission of the research, we will no longer collect any information about you or from you and will delete any information already collected. If you withdraw after the research has been submitted, we will no longer collect any information about you or from you, but we will keep the information about you that we have already obtained as we are not allowed to tamper with study records and this information may have already been used in some analyses and may still be used in the final study analyses. To safeguard your rights, we will use no personally identifiable information.

What will happen to the results of the research study?
The results of the study will be presented in the department of Clinical Psychology at the University of Nottingham. The research will be submitted for publication. You will not be identifiable in any presentation of the data. You can also request a copy of the research once it has been completed by contacting Maisie Cropley at Maisie.cropley@nottingham.ac.uk.

Who is organising and funding the research?
This research is being organised by the University of Nottingham.

Who has reviewed the study?
All research in healthcare is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the University of Nottingham Research Ethics Committee.

Research Findings
If you would like to receive a summary of the findings from this study please leave your contact details, for where you would like to receive this, below:

……..

Your contact details will be stored by authorised persons from the University of Nottingham who are organising the research. Once a copy of the findings has been sent to you, your contact details will be deleted.

Further information and contact details:
Maisie Cropley, Maisie.cropley@nottingham.ac.uk

Department of Clinical Psychology
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

Supervised by: Dr Sharron Smith, shsmith@lincoln.ac.uk and Dr Hannah Merdian, hmerdian@lincoln.ac.uk

College of Social Science
University of Lincoln
Brayford Pool
Lincoln
Lincolnshire
LN6 7TS

Appendix D *Participant Debrief Sheet*

Participant Debrief Sheet

Title of Study: "Individuals' lived experience of their relationship with exercise and mind-body connection in recovery from disordered eating"

Name of Researcher: Maisie Cropley
Supervised by: Dr Sharron Smith, Dr Hannah Merdian

We'd like to thank you for taking part in our research study. This research will provide crucial information and broaden our understanding of exercise and mind-body connection in recovery from disordered eating.

Questions and withdrawing
If you wish to withdraw, please contact the researcher at maisie.cropley@nottingham.ac.uk. If you withdraw within a week of participation, we will no longer collect any information about you or from you and will delete any information already collected. If you withdraw more than a week after participation, we will jo longer collect any information about you or from you, but we will keep the information about you that we have already obtained as we are not allowed to tamper with study records and this information may have already been used in some analyses and may still be used in the final study analyses. To safeguard your rights, we will use no personally identifiable information.

If you have any further questions about the study, please feel free to contact the researcher or their supervisor at any time at maisie.cropley@nottingham.ac.uk, shsmith@lincoln.ac.uk, hmerdian@lincoln.ac.uk.

Further help and support
If you have been affected by any of the issues raised by taking part in this study the following organisations may be able to provide help and advice:
First Steps ED: Midlands wide mental health and specialist eating disorder charity.
firststepsed.co.uk – 01332 367571
BEAT: National eating disorder charity.
beateatingdisorders.org.uk – 0808 801 0677
Mind: National mental health charity.
mind.org.uk – 0300 123 3393
Samaritans: National mental health charity.
samaritans.org – 116 123

Contact Details of Researchers
Maisie Cropley, Maisie.cropley@nottingham.ac.uk
Department of Clinical Psychology
Jubilee Campus
Wollaton Road
Nottingham
NG8 1BB

Supervised by: Dr Sharron Smith, shsmith@lincoln.ac.uk and Dr Hannah Merdian, hmerdian@lincoln.ac.uk

College of Social Science
University of Lincoln
Brayford Pool
Lincoln
Lincolnshire
LN6 7TS

Appendix E *Study Advert*

Appendix F *Semi-Structured Interview Schedule*

Interview Schedule

- How would you describe your disordered eating behaviours and thoughts?
- If you engage with exercise, is that to improve your health or for another reason?
- How would you describe your relationship with exercise at present?
- Did you experience a connection between your disordered eating and your relationship with exercise?
- Do you feel your relationship with exercise has changed since you have been in recovery?
    - If yes, how?
- If you received treatment for your disordered eating, was your relationship with exercise explored?
    - If yes, how?
- Are you aware of what a mind-body connection is? Please explain. (Will give brief overview if not aware).
- Do you feel that your mind-body connection influences your relationship with exercise?
- Do you feel you have a strong mind-body connection?
    - If yes, has this changed since you have been in recovery?

Appendix G *Qualitative Interview Initial Coding Exert*

Harriet: And and I think like even if even if I do now fancy like a gym session on on a on a, if I've got like three weeks off it's going because I want that rush of feeling good rather than going because I'm feel like I have to or that I should. And I've kind of started waffling on, I've kind of forgotten what you asked me now *laughs*	"rush of feeling good", emotion regulation Previous compulsion, feelings of guilt "should" Defence, embarrassment causing laughter, or diminishing feelings
Interviewer: *laughs* No, it was like how would you notice if the kind of relationship would come become unhealthy? But yeah, you've answered that. Don't worry.	
Harriet: Yeah, still like, yeah, not not using it for the wrong reasons. Again. And like, not listening to your body and like training through illness or.	Compulsive exercise behaviour Not listening to the body when struggling with DE, MBC
Interviewer: Yeah, I think you've touched on this next question a bit as well, but like obviously you're a competitive swimmer anyway, but what motivates you to engage with exercise nowadays?	
Harriet: Umm. Yeah, it's not just like being a competitive swimmer. It's like I'm an athlete. I kind of, I I've got goals, but it's just the way it makes me feel so like it's just that rush of kind of endorphins and like knowing that you've achieved your goal or even setting goals and like it's also about it gives your day structure as well like knowing that you open the morning, you train, yeah.	Motivation to exercise "Rush of endorphins" emotion regulation Goal driven, healthier relationship with exercise if the goal is not weight and shape Routine, order

Appendix H *Qualitative Interview Deductive Coding Excerpts*

Relevant Transcript Excerpt	Initial Code	Deductive Code
Umm. Yeah, it's not just like being a competitive swimmer. It's like I'm an athlete. I kind of, I I've got goals, but it's just the way it makes me feel so like it's just that rush of kind of endorphins and like knowing that you've achieved your goal or even setting goals and like it's also about it gives your day structure as well like knowing that you open the morning, you train, yeah.	Motivation to exercise Emotion regulation Routine, order	B
"I do think that exercise does give you a deeper understanding of that [mind body connection] and I think when you're like athlete, when you're an athlete like you spend so much time, like connecting to your body all the time, listening to it, listening to what it's saying. So exercise can definitely help with that, I think"	Competitive athlete Understanding MBC Increased awareness of MBC through exercise	F
"I now run every single day because I have a really intense job and it is the only way that I have found to help me like clear my head"	Exercise rigidity Managing stress Emotion regulation	B, D

NB: This table contains excerpts from multiple participant transcripts and is for illustration purposes to demonstrate how the deductive coding framework was applied.

POSTER

Individuals' Relationships with Exercise and Mind-Body Connection in Recovery from Disordered Eating

Maisie Cropley, Dr Hannah Merdian, Dr Sharron Smith

Trent Doctorate in Clinical Psychology

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Introduction

Disordered Eating (DE) is defined as eating behaviours which are restrictive, compulsive or inflexible in nature (1).

Research has investigated the relationship those actively struggling with DE have with exercise. However, these have failed to incorporate a focus on mind-body connection (MBC) and explore individuals' relationship with their mind-body connection and exercise in recovery (2, 3).

Methods

Qualitative Design

Participants: 14 participants in recovery from DE

Procedure: Participants were recruited via social media. Interviews were completed by Microsoft Teams.

Analysis: Data was analysed using reflexive thematic analysis.

Research Aim

To explore the relationships those in recovery from DE have with exercise and mind-body connection.

Results

One superordinate theme '*change in relationship with exercise through enhanced understanding of mind-body connection*' and four interrelated themes were found: *'understanding how the mind and body are connected', 'what the body can physically do' 'managing emotions', and 'strong not skinny'*

Participants relationships with exercise and mind-body connection had changed in recovery from DE. They had an increased awareness of their MBC, and this appeared to be a mechanism of change for their relationships with exercise.

Discussion

- In recovery from DE relationships with exercise change, and this appears to be through an increased awareness of one's MBC.
- Exercise is important in recovery from DE to support emotion regulation.
- Through greater awareness and respect of MBC this individuals can support their DE recovery. Education of MBC could be useful in the prevention and treatment of DE.

References

(1) Mancine RP, Gusfa DW, Moshrefi A, Kennedy SF. Prevalence of disordered eating in athletes categorized by emphasis on leanness and activity type–a systematic review. Journal of eating disorders. 2020 Dec;8(1):1-9. https://doi.org/10.1186/s40337-020-00327-5

(2) Bardone-Cone AM, Hunt RA, Watson HJ. An overview of conceptualizations of eating disorder recovery, recent findings, and future directions. Current Psychiatry Reports. 2018 Sep;20:1-8. https://doi.org/10.1007/s11920-018-0932-9

(3) Calogero RM, Pedrotty KN. The practice and process of healthy exercise: an investigation of the treatment of exercise abuse in women with eating disorders. Eating disorders. 2004 Dec 1;12(4):273-91. https://doi.org/10.1080/10640260490521352

(4) Holland LA, Brown TA, Keel PK. Defining features of unhealthy exercise associated with disordered eating and eating disorder diagnoses. Psychology of sport and exercise. 2014 Jan 1;15(1):116-23. https://doi.org/10.1016/j.psychsport.2013.10.005