

Doctorate in  
Clinical Psychology

Lancaster  
University



**Doctoral Thesis**

Submitted in partial fulfilment of the Lancaster University Doctorate in Clinical Psychology

**Disordered eating and the relationships with post-traumatic stress,  
self-criticism, and fear of compassion**

Doctorate in Clinical Psychology

Lancaster University

Katy Hughes

2016 Intake

## Word count

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<b>Section</b>	<b>Main text</b>	<b>Appendices, including References, Figures and Tables</b>	<b>Total</b>
Abstract	300	-	300
Literature Review	7,313	7,395	14,708
Research Paper	7,586	4,274	11,860
Critical Appraisal	3,103	529	3,632
Ethics Section	5,418	1,161	6,579
Total	23,720	13,359	37,079

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## **Thesis abstract**

Section one reports on a quantitative systematic literature review examining the relationship between post-traumatic stress disorder and eating disorders within a military population. Six academic databases were systematically searched using key words related to the concepts of post-traumatic stress disorder, eating disorders, and military personnel and veterans. The findings suggested that there is a significant positive association between post-traumatic stress disorder and eating disorders within a military population. Females were at a greater likelihood than males of experiencing co-occurring post-traumatic stress disorder and eating disorders. Furthermore, longitudinal studies suggested a directional relationship wherein military personnel and veterans experiencing post-traumatic stress disorder were later more likely to engage in disordered eating behaviours. However, the majority of research reviewed was cross-sectional and related to US military veterans, therefore the area would benefit from additional studies, particularly those examining international active military service members and veterans.

Section two reports on an empirical study examining the effect of fear of compassion on the relationship between self-criticism and disordered eating within an adult population. Individuals across the spectrum of disordered eating took part in an online survey. A series of mediation models were employed in order to explore the relationships between self-criticism, fear of compassion, and disordered eating. Findings indicated that the relationships between two forms of self-criticism, namely self-critical rumination and self-criticism in relation to a sense of personal inadequacy, and disordered eating were mediated by fear of both showing compassion to oneself and receiving compassion from others. These results highlight a need for the assessment of fear of compassion within therapeutic interventions for people who experience disordered eating, particularly in clients who experience high levels of self-criticism.

Section three includes a critical appraisal of the thesis. It includes a summary of overall findings in addition to reflections upon key decision-making points.

## **Declaration**

This thesis documents research undertaken for the Doctorate in Clinical Psychology at the Division for Health Research, Lancaster University. The work presented here is the author's own, except where due reference is made. The work has not been submitted for the award of a higher degree elsewhere.

Name: Katy Hughes

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Date: 30<sup>th</sup> May 2019

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## **Section One: Systematic Literature Review**

The relationship between post-traumatic stress disorder and  
eating disorders in military personnel and veterans

Word count (excluding references, tables and appendices): 7,313

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Prepared in accordance with notes for contributors for *Eating Disorders: The Journal of  
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## **The relationship between post-traumatic stress disorder and eating disorders in military personnel and veterans**

Military personnel and veteran populations are at an increased risk of developing post-traumatic stress disorder. Given risk factors for disordered eating specific to military contexts, and the potential link between post-traumatic stress disorder and eating disorders in non-military populations, the aim of this review was to systematically review the quantitative research evidence concerning the relationship between post-traumatic stress disorder and eating disorders within a military population. A total of 12 studies were identified each utilising observational study designs. The evidence highlighted significant positive associations between post-traumatic stress and eating disorders. It also suggests that individuals in the military with post-traumatic stress disorder are at an increased likelihood of experiencing co-occurring eating disorders. Post-traumatic stress disorder appeared to increase the chances of later developing an eating disorder and was predictive of key eating disorder features including binge eating, 'loss-of-control' eating, and use of compensatory behaviours such as laxative use, vomiting, fasting, and excessive exercise. Findings are discussed in the context of eating disorders serving an emotional regulation function to facilitate coping with psychological distress.

**Keywords:** Post-traumatic stress disorder; eating disorders; military veterans

### **Introduction**

Eating disorders present a significant risk to physical and psychological wellbeing and social functioning (Bohn et al., 2008) and an increased risk of mortality (Arcelus, Mitchell, Wales, & Nielsen, 2011). Over the years, the way eating disorders have been categorised has changed to allow for greater clinical utility (Call, Walsh, & Attia, 2013). Currently, the main diagnostic categories include: 'Anorexia Nervosa' (AN), 'Bulimia Nervosa' (BN), and 'Binge Eating

Disorder' (BED), plus a subset of atypical difficulties defined as 'Other Specified Feeding or Eating Disorder' (OSFED; Diagnostic Statistical Manual of Mental Disorders, Fifth Edition, DSM-5, Association, 2013).<sup>1</sup>

Some overlap is observed between the clinical characteristics of AN and BN including the presence of extreme and rigid dietary rules, body checking, preoccupation with thoughts related to weight, shape, and eating, and compensatory behaviours such as excessive exercise, purging, or misuse of diuretics, laxatives, and insulin (Deiana et al., 2016). However, in addition, severe dietary restriction in AN typically results in extremely low weight. Binge eating, defined as the consumption a larger amount of food than expected based on context, accompanied by a sense of loss of control, forms part of the criteria for both BN and BED. BED was previously subsumed within the category 'Eating Disorder Not Otherwise Specified' (EDNOS); it became a diagnosis in its own right emerging from the latest DSM-5 publication. Within a BED presentation, DSM-5 criteria describe compensatory behaviours as absent and binge eating episodes associated with negative emotional responses such as guilt, self-disgust, and low mood. Other behaviours associated with BED include eating more rapidly than normal, until uncomfortably full, or when not physically hungry. Finally, OSFED (previously EDNOS) is considered when clinical features do not meet the specific criteria for AN, BN, or BED.

Disordered eating may be considered to exist along a spectrum upon which clinical eating disorders are positioned at the opposite pole to healthy eating behaviours. Dieting and unhealthy weight-control behaviours, such as fasting, self-induced vomiting, and use of food

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<sup>1</sup>Current criteria also refer to diagnoses including 'avoidant/restrictive food intake disorder', 'pica', and 'rumination disorder'. In the edition prior to the DSM-5 they were subsumed in the 'Disorders Usually First Diagnosed in Infancy, Childhood or Adolescence' chapter. These diagnoses are not the focus of the current paper (see Bryant-Waugh, Markham, Kreipe, & Walsh, 2010; Ornstein et al., 2013).

substitutes, laxatives, and diuretics, can over time increase the risk of further eating disordered behaviour such as binge eating and loss of control eating (Neumark-Sztainer et al., 2006).

In the US, lifetime prevalence rates of diagnosed eating disorders in females are estimated to be 0.3% for AN, 1% for BN, 1% for BED, and 3.5% for OSFED, with generally lower rates observed in males than females (Smink, Van Hoeken, & Hoek, 2012). These statistics are similar in Europe (Keski-Rahkonen & Mustelin, 2016) where estimates of the prevalence of diagnosed eating disorders in the general population are typically low in females and lower for males (Keski-Rahkonen & Mustelin, 2016). UK estimates suggest a greater proportion of BED (3.2%) and OSFED (3%) than BN (1%) and AN (0.6%; National Institute for Health and Care Excellence; NICE, 2017). In a UK inner-city study, disordered eating was reported by a majority of females with more individuals aged 25-34 as compared with any other age, and most commonly by individuals identifying as White (Solmi, Hatch, Hotopf, Treasure, & Micali, 2014).

There are obvious challenges in estimating prevalence rates from an international perspective, such as cultural differences in presentation, different service provision and access, a lack of reliable data, and the problematic nature of defining caseness through applying Western diagnostic norms in non-Western countries (Makino, Tsuboi, & Dennerstein, 2004). However, a review of the worldwide incidence and prevalence of eating disorders suggests that, perhaps due to increasing urbanisation and industrialisation, rates of all types of eating disorder appear to be rising.

In Western cultures, over 70% of individuals with eating disorders report comorbid difficulties including mood problems (>40%), anxiety (>50%), self-harm (>20%), and substance use (>10%; Keski-Rahkonen & Mustelin, 2016). In particular, there is extensive evidence highlighting a relationship between traumatic experiences, post-traumatic stress

disorder (PTSD), and eating disorders (e.g. Brewerton, 2007; Solmi, Hotopf, Hatch, Treasure, & Micali, 2016). In this context, traumatic experiences extend beyond developmental trauma to include events occurring across the lifespan. This includes, but is not limited to, experience of or exposure to victimisation and bullying, domestic violence, sexual violence, military combat, physical abuse and assault, and death of a relative or friend (Breslau et al., 1996; Dansky, Brewerton, O'Neil, & Kilpatrick, 1997). These experiences may contribute to the development of PTSD symptoms which include a range of distressing cognitive, emotional, behavioural, and visceral experiences such as flashbacks, re-experiencing, emotional numbing, avoidance, and hyperarousal (DSM-5, American Psychiatric Association, 2013). In turn, these difficulties can contribute to greater risk of comorbidity and increased likelihood of eating disorders (Brewerton, 2007). This is especially relevant to eating disorders involving purging behaviours wherein current and lifetime rates of PTSD have been shown to be significantly higher than in non-eating disorder populations (Brewerton, Dansky, O'Neil, & Kilpatrick, 1997).

Military personnel and veteran populations, due to the very nature of their experiences during and after deployment, are at an increased risk of developing common mental health difficulties, PTSD, physical health problems, and substance use issues (Hotopf et al., 2006; Seal, Berthenthal, Miner, Sen, & Marmar, 2007). Estimates of the rate of PTSD in these populations range between 3% and 20% (Hoge & Castro, 2006; Hotopf et al., 2006; Fear et al., 2010; Mulligan et al., 2010; Sundin, Fear, Iverson, Rona, & Wessley, 2010). In US military personnel and veteran samples, compared with PTSD, estimates of diagnosed eating disorders are estimated to be lower at 0.1% for men and between 5% and 8% for females (Bartlett & Mitchell, 2015). Comparable data concerning eating disorders in military personnel and veterans from other countries is scarce. For example, research related to the mental wellbeing of UK military personnel during and after deployment has tended to focus on common mental

health problems and PTSD (e.g. Fear et al., 2010; Mulligan et al., 2010; Sundin et al., 2014). Although total prevalence rates for mental health difficulties are broadly comparable between US and UK military data (Pinder et al., 2012), data regarding eating disorders in the UK military do not appear to be routinely collected and therefore it is more difficult to make similar comparisons for eating disorders. Perhaps a paucity of data partly reflects an underlying bias regarding the populations affected by eating disorders; military and veteran populations have traditionally been male dominated, although this is changing, and a common misperception is that eating disorders are a predominantly female problem (Darcy, 2011). A factor shared by mental health difficulties including PTSD and eating disorders is stigma, which is cited as a barrier to help seeking and access to support in both the general population and military personnel and veterans (Ben-Zeev, Corrigan, Britt, & Langford, 2012). Attitudes towards eating disorders as compared with depression, for example, have been described as significantly more stigmatising and include ideas about individuals experiencing eating disorders being perceived as more fragile, being blamed or responsible for their difficulties, and as using their problems as a way of gaining attention from others (Roehrig & McLean, 2010). The concurrent influence of stigma related to mental health difficulties in general, and that brought about through false assumptions related to eating disorders, could contribute to greater challenges faced by military personnel and veterans in accessing appropriate support. Additionally, the structure and stress brought through the military regime, and expectations placed on military service members, are potentially influential factors in the development of problematic eating habits or exercise regimes. For example, combat exposure, military sexual trauma, worry related to passing physical fitness assessments, pressure to maintain body weight according to external standards, and bullying and pressure from colleagues have been shown to contribute to unsafe dieting and eating behaviours in military men and women (Bartlett &

Mitchell, 2015; Carlton, Manos, & Van Slyke, 2005; Lauder & Campbell, 2001; McNulty, 2001).

In summary, high co-occurrence rates between PTSD and eating disorders in both men and women in clinical populations have been identified (Brewerton, 2007; Killeen et al., 2015; Mitchell, Mazzeo, Schlesinger, Brewerton, & Smith, 2012). Given the prevalence of PTSD within military personnel and veteran populations, risk factors for disordered eating specific to military contexts, and the potential link between PTSD and eating disorders, the aim of this review is to critically appraise and synthesise the research evidence concerning the relationship between PTSD and eating disorders within an international military and veteran population.

## **Method**

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff & Altman, 2009) were used as a framework in the reporting of this systematic review.

### ***Search strategy***

The primary search strategy was developed in consultation with an academic librarian, following which a systematic review was performed using six online databases PubMed, CINAHL, PsycINFO, Web of Science, Cochrane Central Register of Controlled Trials, and EMBASE. Full search strategies are included in Appendix B. A final search was performed on 11<sup>th</sup> March 2019. Reference lists and citations of articles identified in the final search were cross checked in order to identify studies missed in the original search.

Relevant search terms and keywords for the concepts of ‘post-traumatic stress disorder’ and ‘eating disorders’ and range of search terms pertaining to military personnel and/or veterans were identified through previous systematic reviews (e.g. Buckman et al., 2011;

Debell et al., 2014; Vall & Wade, 2015) in addition to those found in titles and abstracts of key papers in each area. The search performed on PubMed for the first concept (eating disorders) included medical subject heading (MeSH) terms ‘anorexia’, ‘anorexia nervosa’, ‘bulimia’, ‘bulimia nervosa’, or ‘binge eating disorder’, combined with free-text searches in Title and Abstract including ‘eating disorder\*’, ‘anorexia’, ‘anorexia nervosa’, ‘bulimia nervosa’, ‘bulimia’, or ‘binge eating disorder’. For the second concept (post-traumatic stress disorder), the search included the MeSH term ‘post traumatic stress disorders’ in addition to free-text searches in Title and Abstract including ‘PTSD’, ‘post traumatic stress’, or ‘posttraumatic stress’. The search for the third concept (military personnel or veterans) included MeSH terms ‘military personnel’ or ‘veterans’, combined with free-text searches in Title and Abstract ‘soldier\*’, ‘deployed’, ‘deployment’, ‘active duty’, ‘military’, ‘veteran\*’, ‘service member\*’, ‘combat’, ‘troop\*’, ‘military’, ‘service personnel’, ‘army’, ‘navy’, ‘marine\*’, ‘air force’, or ‘special forces’. No limits to publication date were applied. These searches were combined to identify the articles to be screened in accordance with the inclusion and exclusion criteria for the current review.

Unique search strategies were developed and tested for each individual database in order to increase consistency across databases and reduce the risk of excluding relevant articles. Where it was not possible to employ MeSH terms due to database functionality (e.g. PsycINFO and CINAHL), database-specific or thesaurus headings were used instead. Free-text searches were included in search strategies for all databases in order to ensure that articles that may not have been indexed correctly, or were yet to be indexed, were not overlooked.

### ***Inclusion criteria***

Articles were assessed according to the following inclusion criteria:

- (1) Reports on quantitative, empirical research



- (2) Involves adult participants (aged  $\geq 18$  years) who were classified as either serving military personnel or veterans
- (3) Includes a validated<sup>2</sup> measure of PTSD
- (4) Includes a validated measure of eating disorders
- (5) Reports on the relationship between PTSD and eating disorders
- (6) Available in English
- (7) Published within a peer-reviewed journal

The exclusion criterion was:

- (1) Studies for which the full article was not available despite additional searches e.g. presented in conference abstract but full details not accessible

### ***Quality assessment***

The methodological quality of eligible studies was assessed using the Effective Public Health Practice Project Quality Assessment Tool (EPHPP; National Collaborating Centre for Methods and Tools, 2008) or the Appraisal Tool for Cross-Sectional Studies (AXIS; Downes, Brennan, Williams, & Dean, 2016) depending on study type. A copy of each tool is included in Appendices 3 and 4. The EPHPP tool is used to assess the quality of observational studies facilitating the systematic assessment and rating of quality across six main areas: selection bias, study design, confounding variable, blinding, data collection, and withdrawal/dropout. A rating of ‘strong’, ‘moderate’, or ‘weak’ is allocated to each area. Studies are then given an overall global rating based on the total number of weak ratings across all areas; those with no weak ratings are rated ‘strong’, those with one weak rating are rated ‘moderate’, and those with two or more weak ratings are rated ‘weak’. The tool demonstrates good construct and

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<sup>2</sup> The term ‘validated’ is used to refer to measures for which sound psychometric properties have been established within previous research examining reliability and validity

content validity and adequate test–retest reliability (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012; Thomas, Ciliska, Dobbins, & Micucci, 2004).

The AXIS tool was specifically developed in order to assess study design, reporting quality, and risk of bias in cross-sectional studies. It includes 20 items, the possible responses to which are ‘yes’, ‘no’, or ‘don’t know’. The quality of each study was assessed and rated by the author. Twenty-five percent of the papers were independently rated by a colleague and a few minor discrepancies were discussed and resolved.

## **Results**

### ***Study selection***

A total of 193 citations were identified through the initial search of PubMed, CINAHL, PsycINFO, Web of Science, EMBASE, and the Cochrane Central Register of Controlled Trials databases. A flow diagram of the study selection process is featured in Figure 1.

[FIGURE 1 NEAR HERE]

Removal of duplicate articles resulted in 116 eligible articles which were screened based on title and abstract according to the pre-determined inclusion/exclusion criteria. A process of citation searching and reference mining of the remaining 45 articles was undertaken which resulted in the identification of two additional articles. All 47 articles were then subject to full text review after which a further 35 articles were excluded. Articles were excluded as: six did not include a validated measure of PTSD, 13 did not include a validated measure of eating disorders, five did not include a validated measure of PTSD or eating disorders, five did not examine the relationship between PTSD and eating disorders, five were not empirical studies (i.e. they were reviews or commentaries), and one was not published in a peer-reviewed journal. Relevant characteristics of the final 12 articles that were included in the review are provided in Table 1.

[TABLE 1 NEAR HERE]

### *General study characteristics*

Included studies report on research that has been undertaken to examine the relationship between PTSD and eating disorders in military personnel and veterans up until the date of the final search on 11<sup>th</sup> March 2019. All 12 studies were conducted in the USA. Two studies were retrospective longitudinal cohort studies (Blais et al., 2017; Mitchell, Porter, Boyko, & Field, 2016), one was a case-control study (Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999), and the remaining nine were cross-sectional studies (Buchholz, King, & Wray, 2018; Dorflinger, Ruser, & Masheb, 2017; Kimbrel et al., 2015; Litwack, Mitchell, Sloan, Reardon, & Miller, 2014; Maguen et al., 2012a; Maguen et al., 2012b; Mitchell, Rasmusson, Bartlett, & Gerber, 2014; Mitchell & Wolf, 2016; Rosenbaum et al., 2016).

Six studies examined all eating disorder diagnoses according to the diagnostic manuals at the time of data collection (Blais et al., 2017; Mitchell, Rasmusson, Bartlett, & Gerber, 2014; Maguen et al., 2012a; Maguen et al., 2012b; Mitchell & Wolf, 2016; Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999) and three studies focused on BN and BED only (Kimbrel et al., 2015; Litwack, Mitchell, Sloan, Reardon, & Miller, 2014; Mitchell, Porter, Boyko, & Field, 2016). One study focused on BED only (Rosenbaum et al., 2016), one on OSFED only (specifically ‘night eating syndrome’; Dorflinger, Ruser, & Masheb, 2017), and one did not refer to diagnoses and instead used a standardised measure of eating disorder symptomatology (Buchholz, King, & Wray, 2018).

All studies recruited or used data from participants who were military veterans, except for one (Mitchell, Porter, Boyko, & Field, 2016) which recruited active military personnel.

### *Participant characteristics*

A total of 1,300,116 participants took part in 12 studies in which sample sizes ranged from 110 to 595,012. The percentage of female participants ranged from 7% to 100%. Across studies the average percentage of females was 12% and pooled mean age was 34.84 years with a pooled standard deviation of 9.40 years.

### ***Outcome measures***

#### *PTSD measures*

Six studies used the Diagnostic Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994) and/or equivalent International Classification of Diseases 9<sup>th</sup> Revision (ICD-9; World Health Organisation, 1975) diagnoses extracted from Veterans Health Administration (VHA) databases (Blais et al., 2017; Maguen et al., 2012a; Maguen et al., 2012b; Mitchell, Rasmusson, Bartlett, & Gerber, 2014; Rosenbaum et al., 2016; Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999). Two studies (Buchholz, King, & Wray, 2018; Mitchell, Porter, Boyko, & Field, 2016) used the PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) and two (Kimbrel et al., 2015; Litwack, Mitchell, Sloan, Reardon, & Miller, 2014) used the Clinician Administered PTSD Scale (CAPS; Blake et al., 1990). One (Dorflinger, Ruser, & Masheb, 2017) used the Primary Care PTSD Screen (PC-PTSD; Cameron & Gusman, 2003), one (Kimbrel et al., 2015) used the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001), one (Mitchell & Wolf, 2016) used the National Stressful Events Scale (NSES; Kilpatrick et al., 2013), and one (Kimbrel et al., 2015) used the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998).

#### *Eating disorder measures*

Five studies used DSM-IV (American Psychiatric Association, 1994) and/or ICD-9 (World Health Organisation, 1975) diagnoses extracted from VHA databases (Blais et al., 2017;

Maguen et al., 2012a; Maguen et al., 2012b; Mitchell, Rasmusson, Bartlett, & Gerber, 2014; Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999). Two (Mitchell, Porter, Boyko, & Field, 2016; Rosenbaum et al., 2016) used the Patient Health Questionnaire Eating Disorder module (PHQ-ED; Striegel-Moore et al., 2010). Two (Buchholz, King, & Wray, 2018; Dorflinger, Ruser, & Masheb, 2017) used the Eating Disorder Examination self-report questionnaire (EDE-Q; Fairburn & Beglin, 1994). One (Kimbrel et al., 2015) used the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2011), one (Dorflinger, Ruser, & Masheb, 2017) used the Night Eating Questionnaire (NEQ; Allison et al., 2008), one (Litwack, Mitchell, Sloan, Reardon, & Miller, 2014) used the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996), and one (Mitchell & Wolf, 2016) used the Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, Christy, Rizvi, & Shireen, 2000).

### ***Quality appraisal***

Quality appraisal results are displayed in Tables 2 and 3. No studies were excluded as a result of the appraisal; however results were used to identify studies' strengths and weaknesses when reporting and synthesising results of the overall review.

[TABLES 2 AND 3 NEAR HERE]

Two studies using a retrospective cohort design (Blais et al., 2017; Mitchell, Porter, Boyko, & Field, 2016) were rated 'moderate' and one study using a case-control design (Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999) was rated 'moderate' using the EPHPP quality assessment tool. All three studies achieved this rating as opposed to a 'strong' overall rating due to issues related to blinding. Although blinding might be considered impracticable due to the nature of these study design, none of these studies commented on the process of blinding whether or not it was possible.

Nine cross-sectional studies were assessed using the AXIS. Potential selection bias was identified within Litwack et al.'s (2014) study wherein individuals were excluded from participation if they were habitually using drugs or alcohol, which was a common difficulty in the studied population (Stecker, Fortney, Owen, McGovern, & Williams, 2010) and could therefore have affected representativeness of the sample. All studies except Buchholz, King, and Wray's (2018) failed to report on power analyses and adequacy of sample size, although most had large sample sizes therefore authors may have assumed that it was clear they were adequately powered. Four studies in which non-responders were reported did not include information to describe their characteristics or how they were addressed (Buchholz, King, & Wray, 2018; Dorflinger, Ruser, & Masheb, 2017; Mitchell & Wolf, 2016; Rosenbaum et al., 2016). It was unclear in two studies (Dorflinger, Ruser, & Masheb, 2017; Litwack, Mitchell, Sloan, Reardon, & Miller, 2014) whether results were internally consistent as tabulated data did not always clearly relate to numerical data in the main text. Finally, two studies did not appear to report all results from planned analyses (Maguen et al., 2012a; Rosenbaum et al., 2016).

Overall it appeared that many papers simply failed to report on some aspects of the studies which were assessed via the quality appraisal tools, potentially due to the brevity of papers prepared for publication. There were no sources of concern as a result of this quality appraisal to warrant outright exclusion from the review.

### ***The relationship between PTSD and ED in military personnel and veterans***

Below is a summary of the papers included in the review. Effects sizes are reported where they were included in the original study or if it was possible to calculate them based on the published data from each study. The common metric of '*r*' has been used for ease of comparison between

studies. For regression studies that did not report zero order correlations, it was not possible to report effect sizes.

### *Studies examining eating disorders as an outcome of PTSD*

In military veterans, PTSD was associated with an increased likelihood of eating disorders, and higher levels of PTSD were linked to increased levels of eating disorder symptoms.

Maguen et al. (2012a) examined rates of eating disorder diagnoses amongst veterans with mental health difficulties. They found that eating disorder diagnoses were significantly more common in veterans with PTSD and co-occurring mental health difficulties than those without PTSD and co-occurring mental health difficulties ( $r=.56$ ). Kimbrel et al. (2015) sought to identify the range and severity of mental health difficulties in returning Iraq/Afghanistan veterans. Their results revealed that veterans who met criteria for PTSD were at an increased likelihood of screening positive for BN or binge eating than those who did not meet criteria for PTSD ( $r=.25$ ). Furthermore, significant positive associations were identified between PTSD symptoms and overall eating disorder symptoms ( $r=.52$ ; Mitchell & Wolf, 2016) with PTSD being a significant predictor of variance in eating disorder symptoms when controlling for the effects of body mass index, self-esteem, and military sexual trauma (Buchholz, King, & Wray, 2018).

In keeping with the above, Mitchell and Wolf (2016) used structural equation modelling to assess the impact of PTSD and emotional regulation on eating disorder symptoms and food addiction. In a primarily male sample of older veterans, PTSD was shown to be significantly associated with eating disorder symptoms ( $r=.52$ ). In addition, PTSD was shown to have an indirect association with eating disorder symptoms, mediated by 'expressive suppression', i.e. changing one's behavioural response to emotion-eliciting events

as an emotional regulation strategy, although it was not possible to determine effect sizes based on the published data.

Overall, the results from these cross-sectional studies suggest that veterans with PTSD are at a significantly increased likelihood of also having an eating disorder, and that greater severity of PTSD relates to increased severity of eating disorder symptoms.

#### *Studies examining PTSD as an outcome of eating disorders*

In a cross-sectional study examining a sample of female veterans attending a primary care clinic, Rosenbaum et al. (2016) observed that rates of psychological difficulties including PTSD were higher in participants who screened positively for BED than those who did not ( $r=.19$ ); additionally, those in the BED group were subject to twice the odds of having a diagnosis of PTSD. Similarly, Dorflinger, Ruser, and Masheb (2017) found that veterans with symptoms of a particular type of eating disorder called ‘night eating syndrome’, were at significantly increased odds of screening positively for PTSD when controlling for body mass index ( $r=.43$ ). In a retrospective review of data from veterans’ electronic medical records systems, Mitchell, Rasmusson, Bartlett, and Gerber (2014) compared female veterans with an eating disorder diagnosis to those without on a range of psychological difficulties. In bivariate analyses they observed that those veterans with an eating disorder diagnosis were significantly more likely to have a PTSD diagnosis ( $r=.35$ ). However, in regression analyses, they found that PTSD did not significantly predict eating disorders, although this study is likely to have been adversely affected by the low numbers of veterans with eating disorders (2.8%) in the overall sample.

Most of these outcomes are consistent with the results in the above section in that overall there appears to be an increased likelihood of PTSD observed in veterans with eating disorders. However, the outcome from Mitchell, Rasmusson, Bartlett, and Gerber’s (2014)



study was not in line with these conclusions as PTSD was not shown to predict eating disorders; however, this may have been due to a small eating disorder subsample.

#### *Longitudinal studies examining PTSD and eating disorders*

Only two studies in this review examined the temporal relationship between PTSD and eating disorders. In a longitudinal retrospective cohort study of military personnel in active service, Mitchell, Porter, Boyko, and Field (2016) employed structural equation modelling to demonstrate that PTSD at baseline was significantly positively associated with binge eating ( $r=.14$ ), loss-of-control eating ( $r=.16$ ), and use of compensatory behaviours ( $r=.14$ ) three years later. Furthermore, rates of PTSD at baseline were significantly higher among those reporting binge eating than those not reporting binge eating three years later. Similarly, Blais et al. (2017) found that veterans diagnosed with PTSD at baseline were also more likely to be diagnosed with eating disorders both one year later ( $r=.08$ ) and five years later ( $r=.11$ ).

#### *Gender differences*

Females with PTSD were at a greater likelihood of having co-occurring eating disorders than males with PTSD ( $r=.49$ ; Maguen et al., 2012b). In addition, females with PTSD and a history of experiencing military sexual trauma were more likely than males with PTSD and a history of military sexual trauma to have co-occurring eating disorders ( $r=.53$ ) and, among females but not males with PTSD, a history of military sexual trauma was significantly associated with eating disorders ( $r=.26$ ; Maguen et al., 2012b). Additionally, Litwack et al. (2014) found that higher levels of PTSD severity were significantly associated with higher levels of BN and BED symptoms, although it was not possible to determine effect sizes based on the published data. However, they found that impact of PTSD severity across genders was similar for BN and BED.

As part of a larger epidemiological study of hospitalised veterans, Striegel-Moore, Garvin, Dohm, and Rosenheck (1999) examined a subsample using a case-control design. Reason for admission to hospital was recorded as a primary diagnosis along with up to nine secondary diagnoses. When comparing veterans with (cases) and without (controls) primary diagnoses of eating disorder, they found that significantly more females with eating disorders than without had a diagnosis of PTSD ( $r=.23$ ), whereas the opposite was observed in males wherein less males with eating disorders than without had a diagnosis of PTSD ( $r=.06$ ). The study reported that for females, eating disorders were significantly more likely to be the primary diagnosis than for males and were associated with co-occurring low mood and anxiety (including PTSD), personality-related diagnoses, and issues related to substance use. In contrast, it was reported that for males, eating disorders were more likely to be secondary diagnoses and were more commonly associated with psychosis, low mood, and issues related to substance use. Overall, these results are somewhat incongruent with the outcomes from other included studies. This could reflect methodological issues related to measurement e.g. primary vs. secondary diagnoses, which influenced the way data were later analysed. These results could also reflect an overall gender bias in approaches to assessment and diagnosis during inpatient admission and treatment of individuals with eating disorders as a whole. If, due to gender bias, PTSD was more readily identified in males, perhaps this contributed to earlier intervention for PTSD in the community and thus lower rates of PTSD in those males which were hospitalised with a primary diagnosis of eating disorder.

In summary, the above studies appear to suggest that females are at a greater likelihood of having co-occurring PTSD and eating disorders than males, particularly those with a history of military sexual trauma. However, gender does not appear to affect symptom severity of co-occurring PTSD and eating disorders.

## Discussion

Moderate prevalence rates of PTSD within the military and potential military-specific risk factors for eating disorders, coupled with the potential link between PTSD and eating disorders in the general population, highlighted a need to further understand how PTSD and eating disorders relate to one another in a military population. This review therefore sought to evaluate and synthesise the literature concerning the nature of the relationship between PTSD and eating disorders in military personnel and veterans.

The available evidence consistently indicated significant associations between PTSD and eating disorders in the military population with greater severity of PTSD symptoms being related to greater severity in eating disorder symptoms, although the vast majority of research in this area was related to veterans and not active service members. Furthermore, it appears that PTSD and eating disorders are at an increased likelihood of co-occurring particularly among females versus males.

Although the majority of research included in this review was conducted using veteran samples and cross-sectional designs, which limits inferences about causality, there was some evidence to suggest a temporal relationship between PTSD and eating disorder at least in active service members. Over time, for military personnel in active service, the experience of PTSD appeared to increase the chances of later developing an eating disorder and was predictive of key eating disorder features including binge eating, 'loss-of-control' eating, and use of compensatory behaviours such as laxative use, vomiting, fasting, and excessive exercise.

One way of understanding this trajectory is to consider the nature and range of negative biopsychosocial sequelae which are characteristic of PTSD. Individuals attempt to survive and cope with traumatic experiences in a range of different ways including, but not

limited to, dissociation, use of drugs or alcohol, self-harm, avoidance and withdrawal, rumination, and self-blame (Olf, Langeland, & Gersons, 2005; Creech & Borsari, 2014). Reports on mechanisms for coping with psychological distress following return from military deployment have also cited bingeing, purging, and excessive exercise (Mattocks et al., 2012). Eating disorders could therefore be conceptualised as coping mechanisms which serve a range of functions aiming to manage distress, including dissociation, self-soothing, self-punishing, and emotional discharge and numbing (Hallings-Pott, Waller, Watson, & Scragg, 2005; Stice, 2002; Wagener & Much, 2010). This is consistent with theories that binge eating, for example, may serve as an emotional regulation strategy (Whiteside et al., 2007). La Mela, Maglietta, Castellini, Amoroso, and Lucarelli (2010) theorised that binge eating and dissociation could be separate yet interrelated phenomena with common functions of regulating negative emotional states and decreasing self-awareness; or, alternatively, they suggested that dissociation could facilitate initiation of binge eating through narrowing of awareness. Trauma is defined as ‘experience of an inescapable stressful event that overwhelms one’s existing coping mechanisms’ that has the potential to trigger dissociation as a coping response (p. 506; van der Kolk & Fisler, 1995). Dissociation through use of behaviours such as binge eating, could be a particularly effective coping mechanism, especially in a military context where an individual may be required to remain and continue to function within a particular setting. Other concomitant behaviours, such as purging, laxative use, or excessive exercise could then emerge as compensatory strategies for an individual subject to military physical fitness and weight checks.

In military populations, guilt and shame have been associated with suicidal ideation (Bryan, Morrow, Etienne, & Ray-Sannerud, 2012; Bryan, Ray-Sannerud, Morrow, & Etienne, 2013). Furthermore, there is strong evidence linking military exposure to and perceived perpetration of moral transgressions with feelings of guilt and shame and an

increased risk of development of combat-related PTSD (Nazarov et al., 2015). It would therefore make sense that eating disorders also could serve a coping mechanism in response to traumatic military experiences linked to overwhelming feelings of guilt, shame, or self-criticism (Gaudet, Sowers, Nugent, & Boriskin, 2016). Furthermore, traumatic military experiences may be centred on the emotion of disgust, including seeing or handling dead or decomposing bodies or body parts, or witnessing the serious or lethal injury of others (Dalgleish & Power, 2004). Disgust sensitivity related to food and the body, including body products, is associated with eating disorder related affect, cognitions, and behaviours (Troop, Treasure, & Serpell, 2002). It may therefore be feasible that eating disorders are triggered or exacerbated by disgust-based trauma experiences. In a similar vein, high rates of military sexual trauma could contribute to the relationship between PTSD and eating disorders in two ways. Experience of military sexual trauma is significantly associated with both obesity and PTSD (Suris & Lind, 2008) and weight gain is also associated with binge eating and BED (Grucza, Przybeck, & Cloninger, 2007; Hudson, Hiripi, Pope & Kessler, 2007). Binge eating could potentially serve as a coping mechanism to manage distress in the first instance, with resulting weight gain serving a secondary self-protective and adaptive function as a way of protecting oneself from future sexual advances (Gustafson & Sarwar, 2004; Wiederman, Sansone, & Sansone, 1999). Weight gain could also result in failure of fitness and weight assessments and result in discharge from military service.

In all but one of the studies included in this review, the concurrent examination of PTSD and eating disorder symptoms precluded definitive determination of the temporal order in which the symptoms presented. However, in a longitudinal study Jacobson et al. (2009) examined the effect of military deployment on disordered eating in a large military cohort. Although they did not identify an overall significant effect of deployment they did identify that, in females, deployment including exposure to combat was significantly associated with

an increased risk of new-onset disordered eating as compared with deployment without combat exposure. It is therefore possible that the trauma associated with combat exposure creates a potential vulnerability to eating disorders subsequent to trauma reactions including PTSD, an effect which has been suggested in the general population (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004; Smith, Ortiz, Forrest, Velkoff, & Dodd, 2018). Also, given that the current review suggested that females were at a greater likelihood than males of experiencing co-occurring PTSD and eating disorders, it could be that the role of combat exposure for females in particular is an important area that requires further research attention.

### ***Strengths and limitations***

Several general strengths and weaknesses are inherent to the quantitative systematic literature review methodology in addition to others that are more specific to the current review. This type of review aims to balance maximisation of methodological rigour with minimisation of bias through prospectively defining explicit and replicable procedures which are developed with an aim of systematically identifying relevant evidence. However, this approach by its very nature is intrinsically subject to publication bias. In addition, the current review did not incorporate grey literature, including non-commercially published literature such as theses and dissertations, which could have contributed to an increased vulnerability to publication bias and potentially resulted in a less comprehensive outcome. Consequently, with these important limitations in mind, any conclusions drawn from the results of this review should be held tentatively.

The level of research evidence yielded by this review offers a further limitation in that all included studies were observational studies. Although this type of research is congruent with the review question, many of the study designs preclude inferences about causality and

directionality thus limiting the conclusions that may be drawn. Although an outcome of this review suggests that eating disorders could serve a functional purpose of managing psychological distress including PTSD, there is also some evidence to suggest that eating disorders could exist prior to entering the military (Garber, Boyer, Pollack, Chang, & Shafer, 2008). Therefore it also could be that pre-existing and potentially sub-clinical eating disorders are then exacerbated by subsequent development of PTSD. Alternatively, it could be that both of these processes are important; the relationship between PTSD and eating disorders would therefore benefit from further scrutiny through prospective longitudinal studies.

Data for several of the studies included in this review were retrospectively extracted from veterans' healthcare databases which meant that large sample sizes were possible. However, in order to be included in the database, the sample must have had at least one visit to a healthcare facility and therefore does not reflect those who have not accessed services. There is also a risk that two of the included studies using such databases were drawing their samples from overlapping data. Blais et al. (2017) used data ranging from 2004 to 2014 compared with Mitchell, Porter, Boyko, and Field (2016) who used data spanning 2001 to 2008. However, based on the information reported in the articles it was not possible to determine whether or to what extent the same data were drawn upon. Furthermore, the authors' use of pre-existing data rather than conducting their own diagnostic interviews meant it was not possible to verify the quality of data collection. Although the accuracy of eating disorders diagnoses within veterans' healthcare databases has not been examined, investigations into the validity of other diagnostic data suggest under-estimations of rates of diagnoses (Kim et al., 2012; Szeto, Coleman, Gholami, Hoffman, & Goldstein, 2002). Additionally, studies that used standardised and validated self-report questionnaires, which were indicative of eating disorders rather than being true diagnostic tools, have an inherent risk of response bias.

It is evident from this review, which aimed to incorporate international research concerning both military personnel and veterans, that US veterans are hugely overrepresented in the body of literature. This should be borne in mind when considering the application of review outcomes to populations that do not fit within these parameters. Furthermore, there also appears to be an absence of international literature related to active service members or veterans. It is possible that this reflects bias in terms of failure or inability to conduct or publish research in other countries. In addition, the current review excluded research studies that were not available in English which unavoidably increases the risk that evidence from non-English speaking countries was overlooked. These findings reflect a need for more research concerning eating disorders in military personnel and veterans internationally.

The average level of females participating in the studies included in this review corresponds well with the estimated number of females currently in active service within both the UK military and the US military (Dempsey, 2019; US Department of Defense, 2017). As this review suggests that females are at a great likelihood of having co-occurring PTSD and eating disorders, female military service members and veterans might benefit from concurrent screening for both types of difficulty. Furthermore, outside of the military context, there are general differences in the way males present with eating disorders as compared with females (Lewinsohn, Seeley, Moerk, & Striegel-Moore, 2002; Murray et al., 2017). Such differences are not yet acknowledged or accounted for within diagnostic criteria which could skew data and estimations of prevalence and severity of eating disorders within the included studies. Males are typically underrepresented within eating disorder services as well as in research for a number of potential reasons including stigma and failure of assessment and diagnostic tools to examine areas relevant to males (Anderson & Bulik, 2004; Griffiths et al., 2015).

Although many of the included studies did not explicitly exclude participants with AN, rates of AN were low in the overall data within the review in line with comparable data from



the general population. As such, caution should be applied when considering how the review outcomes apply to the AN population. Although these statistics could reflect the lower rates of AN compared with other eating disorder diagnoses in general, equally they could relate underlying theoretical differences in the expression of distress and eating disorders in relation to PTSD and trauma in this population. One report has suggested that in general eating disorders could be underreported due to service members being reluctant to come forward and providers not wanting to diagnose for reasons related to stigma and fears about disqualification from assignments and perceived consequences about being unfit for duty (Bodell, Forney, Keel, Gutierrez, & Joiner, 2014).

Finally, the current review sought to examine the relationship between PTSD and eating disorders therefore inclusion criteria were intentionally engineered to identify studies that focused on eating disorders specifically. As there is overlap between eating disorders and broader eating and food-related difficulties such as emotional eating and food addiction, a review of the research in these areas may yield further ideas of benefit to the field.

### *Clinical implications*

UK guidelines for the treatment of PTSD suggest that, where PTSD and depression co-occur, “usually treat the PTSD first because the depression will often improve with successful PTSD treatment” (p. 20; National Institute for Health and Care Excellence, 2018). Brewerton (2007) suggested that trauma and PTSD should be addressed in order to facilitate recovery from eating disorders. Treatment for people in the military experiencing both PTSD and eating disorders might therefore consider using a similar strategy to that featured in the above guidelines through addressing PTSD symptoms in the first instance. Clinical psychologists and their wider teams working in the areas of general mental health, including those specialising in work with

trauma and/or eating disorders, might benefit from screening for both PTSD and eating disorders when assessing clients, particularly those working in military or veteran contexts.

An important consideration in terms of early intervention could be to continue to offer timely support for military personnel and veterans at risk of or already experiencing PTSD and consider ‘active monitoring’ for eating disorders (i.e. regular reviews when an individual has some symptoms but is not yet receiving a clinical intervention). The outcome of Bodell, Forney, Keel, Gutierrez, and Joiner’s (2014) review into eating disorders in the US military could offer some useful suggestions here. These include screening and prevention designed to reduce stigma including use of self-report or online assessment measures rather than direct interviews to identify people at risk of developing eating disorders.

### ***Conclusion***

The outcome of this review points to a significant association between PTSD and eating disorders within the US military veteran population. Given that PTSD is a particularly relevant form of distress within military personnel and veteran populations worldwide, and potential military-specific risk factors including pressures related to physical fitness and weight, it could be beneficial to develop processes for early identification of and intervention for eating disorders alongside treatment already offered for PTSD. However, more research concerning eating disorders and PTSD in military personnel and veterans internationally is needed, particularly with longitudinal designs to clarify the directionality of relationships between these concepts.

## References

- Allison, K. C., Lundgren, J. D., O'Reardon, J. P., Martino, N. S., Sarwer, D. B., Wadden, T. A., . . . Stunkard, A. J. (2008). The Night Eating Questionnaire (NEQ): psychometric properties of a measure of severity of the Night Eating Syndrome. *Eat Behav*, *9*(1), 62-72.
- Anderson, C. B., & Bulik, C. M. (2004). Gender differences in compensatory behaviors, weight and shape salience, and drive for thinness. *Eat Behav*, *5*(1), 1-11.
- Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: a meta-analysis of 36 studies. *Archives of general psychiatry*, *68*(7), 724-731.
- Armijo-Olivo, S., Stiles, C. R., Hagen, N. A., Biondo, P. D., & Cummings, G. G. (2012). Assessment of study quality for systematic reviews: a comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: methodological research. *Journal of evaluation in clinical practice*, *18*(1), 12-18.
- Association, A. P. (1994). *Diagnostic and statistical manual of mental disorders (4th ed., text rev.)*. Washington, D.C.: American Psychiatric Association.
- Association, A. P. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Washington, D.C.: American Psychiatric Association.
- Bartlett, B. A., & Mitchell, K. S. (2015). Eating disorders in military and veteran men and women: A systematic review. *International Journal of Eating Disorders*, *48*(8), 1057-1069.
- Ben-Zeev, D., Corrigan, P. W., Britt, T. W., & Langford, L. (2012). Stigma of mental illness and service use in the military. *Journal of Mental Health*, *21*(3), 264-273.

- Blake, D., Weathers, F., Nagy, L., Kaloupek, D., Klauminzer, G., Charney, D., & Keane, T. (1990). Clinician-administered PTSD scale (CAPS). *Boston (Mass)*, 7.
- Blais, R.K., Brignone, E., Maguen, S., Carter, M.E., Fargo, J.D., & Gundlapalli, A.V. (2017). Military sexual trauma is associated with post-deployment eating disorders among Afghanistan and Iraq veterans. *International Journal of Eating Disorders*, 50, 808-816.
- Bodell, L., Forney, K. J., Keel, P., Gutierrez, P., & Joiner, T. E. (2014). Consequences of Making Weight: A Review of Eating Disorder Symptoms and Diagnoses in the United States Military. *Clinical Psychology: Science and Practice*, 21(4), 398-409.
- Bohn, K., Doll, H. A., Cooper, Z., O'Connor, M., Palmer, R. L., & Fairburn, C. G. (2008). The measurement of impairment due to eating disorder psychopathology. *Behav Res Ther*, 46(10), 1105-1110. doi:<https://doi.org/10.1016/j.brat.2008.06.012>
- Breslau, N., Kessler, R. C., Chilcoat, H. D., Schultz, L. R., Davis, G. C., & Andreski, P. (1998). Trauma and posttraumatic stress disorder in the community: the 1996 Detroit Area Survey of Trauma. *Archives of general psychiatry*, 55(7), 626-632.
- Brewerton, T. D. (2007). Eating disorders, trauma, and comorbidity: Focus on PTSD. *Eating Disorders*, 15(4), 285-304.
- Bryan, C. J., Morrow, C. E., Etienne, N., & Ray-Sannerud, B. (2013). Guilt, shame, and suicidal ideation in a military outpatient clinical sample. *Depression and Anxiety*, 30(1), 55-60.
- Bryan, C. J., Ray-Sannerud, B., Morrow, C. E., & Etienne, N. (2013). Guilt is more strongly associated with suicidal ideation among military personnel with direct combat exposure. *Journal of Affective Disorders*, 148(1), 37-41. doi:<https://doi.org/10.1016/j.jad.2012.11.044>

- Bryant-Waugh, R., Markham, L., Kreipe, R. E., & Walsh, B. T. (2010). Feeding and eating disorders in childhood. *International Journal of Eating Disorders, 43*(2), 98-111.
- Buchholz, L.J., King, P.R., & Wray, L.O. (2018). Rates and correlates of disordered eating among women veterans in primary care. *Eating Behaviours, 30*, 28-34.
- Buckman, J. E. J., Sundin, J., Greene, T., Fear, N. T., Dandeker, C., Greenberg, N., & Wessely, S. (2011). The impact of deployment length on the health and well-being of military personnel: a systematic review of the literature. *Occupational and Environmental Medicine, 68*(1), 69. doi:10.1136/oem.2009.054692
- Call, C., Walsh, B. T., & Attia, E. (2013). From DSM-IV to DSM-5: changes to eating disorder diagnoses. *Curr Opin Psychiatry, 26*(6), 532-536.  
doi:10.1097/YCO.0b013e328365a321
- Cameron, R. P., & Gusman, D. (2003). The primary care PTSD screen (PC-PTSD): development and operating characteristics. *Primary care psychiatry, 9*(1), 9-14.
- Carlton, J. R., Manos, G. H., & Van Slyke, J. A. (2005). Anxiety and abnormal eating behaviors associated with cyclical readiness testing in a naval hospital active duty population. *Military Medicine, 170*(8), 663-667.
- Creech, S. K., & Borsari, B. (2014). Alcohol use, military sexual trauma, expectancies, and coping skills in women veterans presenting to primary care. *Addictive Behaviors, 39*(2), 379-385.
- Dansky, B. S., Brewerton, T. D., Kilpatrick, D. G., & O'Neil, P. M. (1997). The National Women's Study: relationship of victimization and posttraumatic stress disorder to bulimia nervosa. *International Journal of Eating Disorders, 21*(3), 213-228.
- Darcy, A. (2011). Eating Disorders in Adolescent Males: An Critical Examination of Five Common Assumptions. *Adolescent Psychiatry, 1*(4), 307-312.

- Debell, F., Fear, N. T., Head, M., Batt-Rawden, S., Greenberg, N., Wessely, S., & Goodwin, L. (2014). A systematic review of the comorbidity between PTSD and alcohol misuse. *Social Psychiatry and Psychiatric Epidemiology*, *49*(9), 1401-1425.  
doi:10.1007/s00127-014-0855-7
- Defense, U. D. o. (Producer). (2017). Profile of the Military Community. Retrieved from <http://download.militaryonesource.mil/12038/MOS/Reports/2017-demographics-report.pdf>
- Deiana, V., Diana, E., Pinna, F., Atzeni, M. G., Medda, F., Manca, D., . . . Carpiniello, B. (2016). Clinical features in insulin-treated diabetes with comorbid diabulimia, disordered eating behaviors and eating disorders. *European Psychiatry*, *33*, S81.  
doi:10.1016/j.eurpsy.2016.01.029
- Dempsey, N. (Producer). (2019). UK Defence Personnel Statistics. *House of Commons Library*. Retrieved from [researchbriefings.files.parliament.uk/documents/CBP-7930/CBP-7930.pdf](https://researchbriefings.files.parliament.uk/documents/CBP-7930/CBP-7930.pdf)
- Dorflinger, L.M., Ruser, C.B., & Masheb, R.M. (2017). Night eating among veterans with obesity. *Appetite*, *117*, 330-334.
- Downes, M. J., Brennan, M. L., Williams, H. C., & Dean, R. S. (2016). Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). *BMJ Open*, *6*(12), e011458. doi:10.1136/bmjopen-2016-011458
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, *16*(4), 363-370.
- Fear, N. T., Jones, M., Murphy, D., Hull, L., Iversen, A. C., Coker, B., . . . Jones, N. (2010). What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces? A cohort study. *The Lancet*, *375*(9728), 1783-1797.

- First, M. B., Spitzer, R.L., Williams, J.B.W., Gibbon, M. (1995). *Structured Clinical Interview for DSM-IV (SCID)* Wash DC: American Psychiatric Association.
- Garber, A. K., Boyer, C. B., Pollack, L. M., Chang, Y. J., & Shafer, M.-A. (2008). Body mass index and disordered eating behaviors are associated with weight dissatisfaction in adolescent and young adult female military recruits. *Military Medicine*, *173*(2), 138-145.
- Gaudet, C. M., Sowers, K. M., Nugent, W. R., & Boriskin, J. A. (2016). A review of PTSD and shame in military veterans. *Journal of Human Behavior in the Social Environment*, *26*(1), 56-68. doi:10.1080/10911359.2015.1059168
- Griffiths, S., Murray, S. B., & Touyz, S. (2015). Extending the masculinity hypothesis: An investigation of gender role conformity, body dissatisfaction, and disordered eating in young heterosexual men. *Psychology of Men & Masculinity*, *16*(1), 108.
- Grucza, R. A., Przybeck, T. R., & Cloninger, C. R. (2007). Prevalence and correlates of binge eating disorder in a community sample. *Comprehensive Psychiatry*, *48*(2), 124-131.
- Gustafson, T. B., & Sarwer, D. B. (2004). Childhood sexual abuse and obesity. *Obes Rev*, *5*(3), 129-135. doi:10.1111/j.1467-789X.2004.00145.x
- Hallings-Pott, C., Waller, G., Watson, D., & Scragg, P. (2005). State dissociation in bulimic Eating Disorders: An experimental study. *International Journal of Eating Disorders*, *38*(1), 37-41. doi:10.1002/eat.20146
- Hoge, C. W., & Castro, C. A. (2006). Post-traumatic stress disorder in UK and US forces deployed to Iraq. *Lancet*, *368*(9538), 837.
- Hotopf, M., Hull, L., Fear, N. T., Browne, T., Horn, O., Iversen, A., . . . Earnshaw, M. (2006). The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *The Lancet*, *367*(9524), 1731-1741.

- Hudson, J. I., Hiripi, E., Pope Jr, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological psychiatry*, *61*(3), 348-358.
- Jacobi, C., Hayward, C., de Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin*, *130*(1), 19.
- Jacobson, I. G., Smith, T. C., Smith, B., Keel, P. K., Amoroso, P. J., Wells, T. S., . . . Team, M. C. S. (2009). Disordered eating and weight changes after deployment: longitudinal assessment of a large US military cohort. *American journal of epidemiology*, *169*(4), 415-427.
- Keski-Rahkonen, A., & Mustelin, L. (2016). Epidemiology of eating disorders in Europe: prevalence, incidence, comorbidity, course, consequences, and risk factors. *Curr Opin Psychiatry*, *29*(6), 340-345.
- Killeen, T., Brewerton, T. D., Campbell, A., Cohen, L. R., & Hien, D. A. (2015). Exploring the relationship between eating disorder symptoms and substance use severity in women with comorbid PTSD and substance use disorders. *The American Journal of Drug and Alcohol Abuse*, *41*(6), 547-552. doi:10.3109/00952990.2015.1080263
- Kilpatrick, D. G., Resnick, H. S., Milanak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *Journal of Traumatic Stress*, *26*(5), 537-547.
- Kim, H. M., Smith, E. G., Stano, C. M., Ganoczy, D., Zivin, K., Walters, H., & Valenstein, M. (2012). Validation of key behaviourally based mental health diagnoses in administrative data: suicide attempt, alcohol abuse, illicit drug abuse and tobacco use. *BMC Health Services Research*, *12*(1), 18. doi:10.1186/1472-6963-12-18



- Kimrel, L.A., DeBeer, B.B., Meyer, E.C., Silvia, P.J., Beckham, J.C., Young, K.A., & Morissette, S.B. (2015). An examination of the broader effects of warzone experiences on returning Iraq/Afghanistan veterans' psychiatric health. *Psychiatry Research, 226*, 78-83.
- La Mela, C., Maglietta, M., Castellini, G., Amoroso, L., & Lucarelli, S. (2010). Dissociation in eating disorders: relationship between dissociative experiences and binge-eating episodes. *Comprehensive Psychiatry, 51*(4), 393-400.  
doi:<https://doi.org/10.1016/j.comppsy.2009.09.008>
- Lauder, T. D., & Campbell, C. S. (2001). Abnormal Eating Behaviors in Female Reserve Officer Training Corps Cadets. *Military Medicine, 166*(3), 264-268.  
doi:10.1093/milmed/166.3.264
- Lewinsohn, P. M., Seeley, J. R., Moerk, K. C., & Striegel-Moore, R. H. (2002). Gender differences in eating disorder symptoms in young adults. *International Journal of Eating Disorders, 32*(4), 426-440.
- Litwack, S.D., Mitchell, K.S., Sloan, D.M., Reardon, A.F., & Miller, M.W. (2014). Eating disorder symptoms and comorbid psychopathology among male and female veterans. *General Hospital Psychiatry, 36*, 406-410.
- Maguen, S., Cohen, B., Cohen, G., Madden, E., Bertenthal, D., & Seal, K. (2012a). Eating Disorders and Psychiatric Comorbidity among Iraq and Afghanistan Veterans. *Women's Health Issues, 22*(4), 403-406.
- Maguen, S., Cohen, B., Ren, L., Bosch, J., Kimerling, R., & Seal, K. (2012b). Gender Differences in Military Sexual Trauma and Mental Health Diagnoses among Iraq and Afghanistan Veterans with Posttraumatic Stress Disorder. *Women's Health Issues, 22*(1), 61-66.

- Makino, M., Tsuboi, K., & Dennerstein, L. (2004). Prevalence of eating disorders: a comparison of Western and non-Western countries. *Medscape general medicine*, 6(3).
- Mattocks, K. M., Haskell, S. G., Krebs, E. E., Justice, A. C., Yano, E. M., & Brandt, C. (2012). Women at war: Understanding how women veterans cope with combat and military sexual trauma. *Social science & medicine*, 74(4), 537-545.
- McNulty, A. F. (2001). Prevalence and Contributing Factors of Eating Disorder Behaviors in Active Duty Service Women in the Army, Navy, Air Force, and Marines. *Military Medicine*, 166(1), 53-58. doi:10.1093/milmed/166.1.53
- Mitchell, K. S., Mazzeo, S. E., Schlesinger, M. R., Brewerton, T. D., & Smith, B. N. (2012). Comorbidity of partial and subthreshold ptsd among men and women with eating disorders in the national comorbidity survey-replication study. *The International journal of eating disorders*, 45(3), 307-315. doi:10.1002/eat.20965
- Mitchell, K.S., Porter, B., Boyko, E.J., & Field, A.E. (2016). Longitudinal Associations Among Posttraumatic Stress Disorder, Disordered Eating, and Weight Gain in Military Men and Women. *American Journal of Epidemiology*. 184(1), 33-47.
- Mitchell, K.S., Rasmusson, A., Bartlett, B., & Gerber, M.R. (2014). Eating disorders and associated mental health comorbidities in female veterans. *Psychiatry Research*, 219, 589-591.
- Mitchell, K.S., & Wolf, E.J. (2016). PTSD, foodaddiction, and disordered eating in a sample of primarily older veterans: The mediating role of emotion regulation. *Psychiatry Research*, 243, 23-29.
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, 6(7), e1000097. doi:10.1371/journal.pmed.1000097

- Mulligan, K., Jones, N., Woodhead, C., Davies, M., Wessely, S., & Greenberg, N. (2010). Mental health of UK military personnel while on deployment in Iraq. *The British Journal of Psychiatry*, *197*(5), 405-410.
- Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., . . . Mond, J. M. (2017). The enigma of male eating disorders: A critical review and synthesis. *Clin Psychol Rev*, *57*, 1-11. doi:<https://doi.org/10.1016/j.cpr.2017.08.001>
- Nazarov, A., Jetly, R., McNeely, H., Kiang, M., Lanius, R., & McKinnon, M. C. (2015). Role of morality in the experience of guilt and shame within the armed forces. *Acta Psychiatrica Scandinavica*, *132*(1), 4-19. doi:10.1111/acps.12406
- Neumark-Sztainer, D., Wall, M., Guo, J., Story, M., Haines, J., & Eisenberg, M. (2006). Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: how do dieters fare 5 years later? *Journal of the American Dietetic Association*, *106*(4), 559-568.
- National Institute for Health and Care Excellence (NICE). (2017). Eating disorders. Retrieved from <https://www.nice.org.uk/guidance/ng69/resources/eating-disorders-recognition-and-treatment-pdf-1837582159813>
- National Institute for Health and Care Excellence (NICE). (2018). Post-traumatic stress disorder. Retrieved from <https://www.nice.org.uk/guidance/ng116/resources/posttraumatic-stress-disorder-pdf-66141601777861>
- Olf, M., Langeland, W., & Gersons, B. P. (2005). The psychobiology of PTSD: coping with trauma. *Psychoneuroendocrinology*, *30*(10), 974-982.
- Ornstein, R. M., Rosen, D. S., Mammel, K. A., Callahan, S. T., Forman, S., Jay, M. S., . . . Walsh, B. T. (2013). Distribution of eating disorders in children and adolescents using

- the proposed DSM-5 criteria for feeding and eating disorders. *Journal of Adolescent Health, 53*(2), 303-305.
- Pinder, R. J., Iversen, A. C., Kapur, N., Wessely, S., & Fear, N. T. (2012). Self-harm and attempted suicide among UK Armed Forces personnel: Results of a cross-sectional survey. *International journal of social psychiatry, 58*(4), 433-439.
- Roehrig, J. P., & McLean, C. P. (2010). A comparison of stigma toward eating disorders versus depression. *International Journal of Eating Disorders, 43*(7), 671-674.
- Rosenbaum, D.L., Kimerling, R., Pomernacki, A., Goldstein, K.M., Yano, E.M., Sadler, A.G., Carney, D., Bastian, L.A., Bean-Mayberry, B.A., & Frayne, S.M. (2016). Binge Eating among Women Veterans in Primary Care: Comorbidities and Treatment Priorities. *Women's Health Issues, 26*(4), 420-428.
- Seal, K. H., Bertenthal, D., Miner, C. R., Sen, S., & Marmar, C. (2007). Bringing the war back home: mental health disorders among 103 788 US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. *Archives of internal medicine, 167*(5), 476-482.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry.*
- Smink, F. R., Van Hoeken, D., & Hoek, H. W. (2012). Epidemiology of eating disorders: incidence, prevalence and mortality rates. *Curr Psychiatry Rep, 14*(4), 406-414.
- Smith, A. R., Ortiz, S. N., Forrest, L. N., Velkoff, E. A., & Dodd, D. R. (2018). Which Comes First? An Examination of Associations and Shared Risk Factors for Eating Disorders and Suicidality. *Curr Psychiatry Rep, 20*(9), 77. doi:10.1007/s11920-018-0931-x

- Solmi, F., Hatch, S. L., Hotopf, M., Treasure, J., & Micali, N. (2014). Prevalence and correlates of disordered eating in a general population sample: the South East London Community Health (SELCoH) study. *Social Psychiatry and Psychiatric Epidemiology*, *49*(8), 1335-1346.
- Solmi, F., Hotopf, M., Hatch, S., Treasure, J., & Micali, N. (2016). Eating disorders in a multi-ethnic inner-city UK sample: prevalence, comorbidity and service use. *Social Psychiatry and Psychiatric Epidemiology*, *51*(3), 369-381.
- Stecker, T., Fortney, J., Owen, R., McGovern, M. P., & Williams, S. (2010). Co-occurring medical, psychiatric, and alcohol-related disorders among veterans returning from Iraq and Afghanistan. *Psychosomatics*, *51*(6), 503-507.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: a meta-analytic review. *Psychological Bulletin*, *128*(5), 825.
- Stice, E., Telch, C. F., & Rizvi, S. L. (2000). Development and validation of the Eating Disorder Diagnostic Scale: a brief self-report measure of anorexia, bulimia, and binge-eating disorder. *Psychological Assessment*, *12*(2), 123.
- Striegel-Moore, R.H., Garvin, V., Dohm, F., & Rosenheck, R.A. (1999). Eating Disorders in a National Sample of Hospitalized Female and Male Veterans: Detection Rates and Psychiatric Comorbidity. *International Journal of Eating Disorders*, *25*(4), 405-414.
- Striegel-Moore, R. H., Perrin, N., DeBar, L., Wilson, G. T., Rosselli, F., & Kraemer, H. C. (2010). Screening for binge eating disorders using the Patient Health Questionnaire in a community sample. *International Journal of Eating Disorders*, *43*(4), 337-343.
- Sundin, J., Fear, N. T., Iversen, A., Rona, R. J., & Wessely, S. (2010). PTSD after deployment to Iraq: conflicting rates, conflicting claims. *Psychological Medicine*, *40*(3), 367-382.

- Sundin, J., Herrell, R. K., Hoge, C. W., Fear, N. T., Adler, A. B., Greenberg, N., . . . Bliese, P. D. (2014). Mental health outcomes in US and UK military personnel returning from Iraq. *The British Journal of Psychiatry, 204*(3), 200-207.
- Surís, A., & Lind, L. (2008). Military sexual trauma: A review of prevalence and associated health consequences in veterans. *Trauma, Violence, & Abuse, 9*(4), 250-269.
- Szeto, H. C., Coleman, R. K., Gholami, P., Hoffman, B. B., & Goldstein, M. K. (2002). Accuracy of computerized outpatient diagnoses in a Veterans Affairs general medicine clinic. *The American journal of managed care, 8*(1), 37-43.
- Thomas, B., Ciliska, D., Dobbins, M., & Micucci, S. (2004). A process for systematically reviewing the literature: providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing, 1*(3), 176-184.
- Tools, N. C. C. f. M. a. (2008). Quality assessment tool for quantitative studies. *Hamilton: The Effective Public Health Practice Project. URL: <http://www.ehphp.ca/PDF/Quality%20Assessment>, 20.*
- Troop, N. A., Treasure, J. L., & Serpell, L. (2002). A further exploration of disgust in eating disorders. *European Eating Disorders Review, 10*(3), 218-226.
- 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. doi:10.1002/eat.22411
- van der Kolk, B. A., & Fisler, R. (1995). Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *Journal of Traumatic Stress, 8*(4), 505-525. doi:10.1007/bf02102887
- Wagener, A. M., & Much, K. (2010). Eating disorders as coping mechanisms. *Journal of College Student Psychotherapy, 24*(3), 203-212.

- Weathers, F. W., Litz, B. T., Herman, D. S., Huska, J. A., & Keane, T. M. (1993). *The PTSD Checklist (PCL): Reliability, validity, and diagnostic utility*. Paper presented at the annual convention of the international society for traumatic stress studies, San Antonio, TX.
- Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eat Behav*, 8(2), 162-169.
- Wiederman, M. W., Sansone, R. A., & Sansone, L. A. (1999). Obesity among sexually abused women: an adaptive function for some? *Women & health*, 29(1), 89-100.
- World Health Organization (WHO). (1975). *ICD-9-CM: International classification of diseases, 9th revision, clinical modification*. Salt Lake City, Utah: Medicode.
- Zimmerman, M., & Mattia, J. I. (2001). The Psychiatric Diagnostic Screening Questionnaire: development, reliability and validity. *Comprehensive Psychiatry*.

Figure 1. Study selection flow diagram

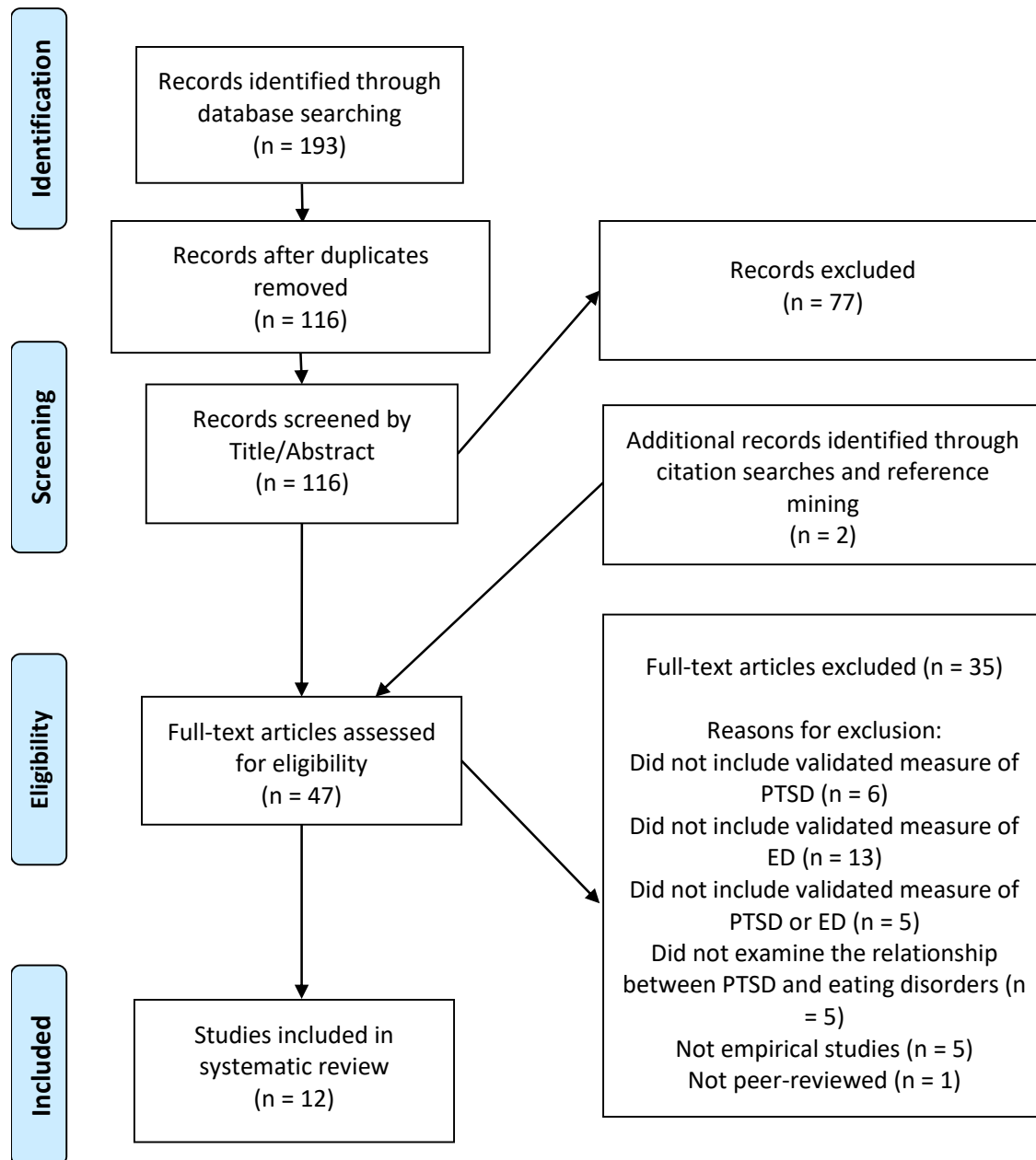




Table 1. Summary of reviewed studies examining the relationship between PTSD and disordered eating in military personnel or veterans

Author (year) (country)	Study design	Sample size, characteristics	PTSD measure	ED measure	Analysis	Relationship between PTSD and ED
Blais et al. (2017)	Retrospective cohort study (three time points)  Time 1 (baseline): First VHA encounter  Time 2: One year following first VHA encounter  Time 3: Five years following first VHA encounter	Year 1 cohort (Time 2) N = 595,012 12.3% female Age, years [mean (SD)]: 38.88 (9.5)  Year 5 cohort (Time 3) N = 595,012 12.3% female Age, years [mean (SD)]: 38.88 (9.5)	1. ICD-9 diagnosis extracted from VHA database	1. ICD-9 diagnosis extracted from VHA database	Logistic regression analysis, adjusted ORs	When controlling for all other demographics, those with PTSD at Time 1 were more likely to be diagnosed with an ED at Time 2 ( $X^2 = 156.0(1), p < .001$ ; adjusted OR=1.33, 95% CI=1.09-1.62, $p < .05$ ) and at Time 3 ( $X^2 = 120.2(1), p < .001$ ; adjusted OR=1.51, 95% CI=1.21-1.88, $p < .05$ ). Effect sizes transformed to $r=.08$ (Time 2) and $r=.11$ (Time 3)
Buchholz, King, & Wray (2018)	Cross-sectional	N = 176 100.0% female Age, years [mean (SD)]: 51.4 (10.48)	1. PCL-5	1. EDE-Q	Pearson's product moment correlation ( $r$ ), hierarchical regression analysis	There was a significant positive relationship between PTSD and EDE-Q global score ( $r=.51, p < .001$ ) and each of the EDE-Q subscales: dietary restraint ( $r=.32, p < .001$ ), shape concern ( $r=.49, p < .001$ ), weight concern ( $r=.50, p < .001$ ), and eating concern ( $r=.44, p < .001$ ). PTSD was a significant predictor of variance in EDE-Q global score ( $\beta=.34, SE=.005, t=4.469, p < .0001$ ) and on each of the EDE-Q subscales: dietary restraint ( $r=.32, p < .001$ ), shape concern ( $r=.49, p < .001$ ), weight concern ( $r=.50, p < .001$ ), and eating concern ( $r=.44, p < .001$ ).
Dorflinger, Ruser, & Masheb (2017)	Cross-sectional	N = 110 10.0% female Age, years [mean (SD)]: 61.6 (8.5)	1. PC-PTSD	1. EDE-Q 2. NEQ	Pearson's product moment correlation ( $r$ ), hierarchical regression analysis	Positive screen for NES associated with significantly increased likelihood of positive screen for PTSD (OR=0.18, CI=0.05-0.62, $p=.007$ ) Significant positive relationship between NEQ scores and EDE-Q scores ( $r=.326, p < .001$ ). Effect size transformed to $r=.43$
Kimbrel et al. (2015)	Cross-sectional	N = 155 7% female Age, years [mean (SD)]: 40 (10)	1. PDSQ 2. CAPS 3. MINI	1. PDSQ	Chi-squared test ( $\chi^2$ )	Veterans with PTSD were significantly more likely than veterans without PTSD to screen positive for bulimia/binge-eating ( $\chi^2=9.625(1), p = .002$ ). Effect size transformed to $r=.25$

Author (year) (country)	Study design	Sample size, characteristics	PTSD measure	ED measure	Analysis	Relationship
Litwack, Mitchell, Sloan, Reardon, & Miller (2014)	Cross-sectional	N = 499 13.42% female Age, years [mean (SD)]: 51.95 (10.72)	2. CAPS	2. SCID-I	Linear regression analysis (B and z-scores)	Lifetime PTSD symptom severity was significantly associated with lifetime BN severity (B=.01, z=2.46, p=.01) and marginally significantly associated with lifetime BED severity (B=.01, z=1.99, p=.05). Impact of lifetime PTSD symptom severity did not differ significantly by gender for lifetime BN severity (B=.003, z=.34, p=.73) or lifetime BED severity (B=-.001, z=-.09, p=.93). Current PTSD symptom severity was significantly correlated with current BN and current BN severity (statistics not provided). Gender was not a moderator in the relationship between current PTSD symptom severity and either current BN (B=.00, z=.04, p=.97) or current BED (B=.01, z=.92, p=.36).
Maguen et al. (2012a)	Cross-sectional	N = 593,739 12% female Age, years [mean (SD)]: 31 (8.9)	1. ICD-9 diagnosis extracted from VHA database	1. ICD-9 diagnosis extracted from VHA database	Chi-squared test ( $\chi^2$ ), multiple logistic regression analysis, adjusted ORs	Odds of ED in those with PTSD and co-occurring mental health difficulties greater than in those without PTSD and co-occurring mental health difficulties (adjusted OR=11.29, 95% CI=7.1,18.0). Effect size transformed to $r=.56$ Odds of an ED diagnosis in females greater in those with PTSD than those without PTSD (adjusted OR=5.53, 95% CI=4.6, 6.7, $p<.0001$ ). Odds of an ED diagnosis in males greater in those with PTSD than those without PTSD (adjusted OR=6.85, 95% CI=4.9, 9.5, $p<.0001$ ).
Maguen et al. (2012b)	Cross-sectional	N = 74,493 9.73% female Age, years [mean (SD)]: 31.93 (12.67)	1. ICD-9 and DSM-IV diagnosis extracted from VHA database	1. ICD-9 and DSM-IV diagnosis extracted from VHA database	Chi-squared test ( $\chi^2$ ), multiple logistic regression analysis, adjusted ORs	Females with PTSD were more likely than males with PTSD to have comorbid eating disorders (OR=7.74, 95% CI=5.85,10.23, $p<.001$ ). Effect size transformed to $r=.49$ Females with PTSD and a history of military sexual trauma were more likely than males with PTSD and a history of military sexual trauma to have comorbid eating disorders (OR=9.66, 95% CI=2.34,39.99, $p<.001$ ). Effect size transformed to $r=.53$ Among females with PTSD, a history of military sexual trauma was significantly associated with eating disorders (OR=2.61, 95% CI=1.76,3.88, $p<.001$ ). Effect size transformed to $r=.26$
Mitchell, Porter, Boyko, & Field (2016)	Retrospective cohort study  Three time points Time 1 (baseline): 2001-03 Time 2: 2004-06 Time 3: 2007-08	N = 33,937 18% female Age, years [mean (SD)]: 36.0 (8.9)	1. PCL	1. PHQ-ED	Chi-squared test ( $\chi^2$ ), structural equation modelling	For males and females, PTSD at Time 1 (2001-2003 data) was associated with binge eating ( $\chi^2$ =not reported, $p<.05$ ), loss-of-control eating ( $\chi^2$ =not reported, $p<.05$ ), and compensatory behaviours ( $\chi^2$ =not reported, $p<.05$ ) at Time 2 (2004-2006 data). Rates of PTSD at Time 1 were higher among those reporting binge eating at Time 2 than those not reporting binge eating at Time 2 ( $p<.05$ ).  PTSD at Time 1 was positively associated with binge eating ( $r=.14$ , $p<.05$ ), loss-of-control eating ( $r=.16$ , $p<.05$ ), and compensatory behaviours ( $r=.14$ , $p<.05$ ) at Time 2.

Author (year) (country)	Study design	Sample size, characteristics	PTSD measure	ED measure	Analysis	Relationship
Mitchell, Rasmussen, Bartlett, & Gerber (2014)	Cross-sectional	N = 492 100.0% female Age, years [mean (SD)]: 52.12 (17.12)	1. ICD-9 and DSM-IV diagnosis extracted from VHA database	1. ICD-9 and DSM-IV diagnosis extracted from VHA database	Fisher's exact test, ORs	Females with an ED diagnosis were more likely than women without an ED diagnosis to have a PTSD diagnosis (57.1% vs. 25.9%; Fisher's exact $p=.01$ , OR=3.81, 95% CI=1.28, 11.28, $p<.05$ ). Effect size transformed to $r=.35$ PTSD was not associated with an increased risk of having an ED diagnosis (OR=1.67, 95% CI=0.51-5.48, $p=.40$ ).
Mitchell & Wolf (2016)	Cross-sectional	N = 697 7.89% female Age, years [mean (SD)]: 62.99 (12.03)	<sup>2</sup> 1. NSES	<sup>2</sup> 1. EDDS	Structural equation modelling	PTSD was positively associated with ED symptoms in the full sample ( $r=.519$ , $p<.05$ ) and in males only ( $r=.449$ , $p<.05$ ) An indirect path from PTSD to ED symptoms via expressive suppression was significant ( $b=.192$ , SE=.063, $p=.002$ , 95% CI=.069,.314).
Rosenbaum et al. (2016)	Cross-sectional	N = 484 100.0% female Age, years [mean (SD)]: 51.7 (13.4)	1. ICD-9 diagnosis extracted from VHA database	1. PHQ-ED	Chi-squared test ( $\chi^2$ )	In participants without obesity, significantly greater odds of PTSD in those with symptoms of BED as compared with those without symptoms of BED (adjusted OR=2.01, 95% CI=1.01-4.02, $p<.05$ ). The same increased odds were not observed in participants with obesity. Effect size transformed to $r=.19$
Striegel-Moore, Garvin, Dohm, & Rosenheck (1999)	Case-control (matched on sex, race, age)	Total N = 322 Cases: N = 161 39.13% female Age, years [mean (SD)]: Females = 35.33 (9.82) Males = 53.53 (15.03) Controls: N = 161 39.13% female Age, years [mean (SD)]: Females = 35.35 (9.80) Males = 53.56 (15.01)	1. ICD-9 diagnosis extracted from VHA database	1. ICD-9 diagnosis extracted from VHA database	Chi-squared test ( $\chi^2$ ), ORs	More female cases than controls had a diagnosis of PTSD (25% vs. 8%; $X^2=6.608$ , $p<.001$ , $d=.47$ , 95% CI=0.11-0.83). Effect size transformed to $r=.23$ More male controls than cases had a diagnosis of PTSD (12% vs. 8%; $X^2=.871$ , $p=.132$ , $d=.13$ , 95% CI=-0.15-0.41). Effect size transformed to $r=.06$

Notes: AN, Anorexia Nervosa; BN, Bulimia Nervosa; BED, Binge Eating Disorder; CAPS, Clinician Administered PTSD Scale (Blake et al., 1990); EDE-Q, Eating Disorder Examination self-report questionnaire (Fairburn & Beglin, 1994); EDDS, Eating Disorder Diagnostic Scale (Stice, Telch, Christy, Rizvi, & Shireen, 2000); ICD-9, International Classification of Diseases 9th Revision (World Health Organisation, 1975); MINI, Mini-International Neuropsychiatric Interview (Sheehan et al., 1998); MST, Military sexual trauma; NES, Night eating syndrome; NEQ, Night Eating Questionnaire (Allison et al., 2008); NSES, National Stressful Events Scale (Kilpatrick et al., 2013); OR, Odds Ratio; PC-PTSD, Primary Care PTSD Screen (Cameron & Gusman, 2003); PHQ-ED, Patient Health Questionnaire Eating Disorder module (Striegel-Moore et al., 2010); PDSQ, Psychiatric Diagnostic Screening Questionnaire (Zimmerman & Mattia, 2001); PTSD, Post-traumatic stress disorder; PCL, Post-Traumatic Stress Disorder Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993); SCID-I, Structured Clinical Interview for DSM-IV Axis I Disorders (First, Spitzer, Gibbon, & Williams, 1996); VHA, Veterans Health Administration.

aPTSD was subsumed under the category 'anxiety disorder' in the reporting of this statistic

Table 2. Quality assessment of cohort and case-control studies using the EPHPP tool

<b>Study</b>	<b>Selection bias</b>	<b>Study design</b>	<b>Confounders</b>	<b>Blinding</b>	<b>Data collection methods</b>	<b>Withdrawals and Drop-outs</b>	<b>Global quality rating</b>
Blais et al. (2017)	Strong	Moderate	Strong	Weak	Strong	N/A	Moderate
Mitchell, Porter, Boyko, & Field (2016)	Strong	Moderate	Strong	Weak	Strong	N/A	Moderate
Striegel-Moore, Garvin, Dohm, & Rosenheck (1999)	Strong	Moderate	Strong	Weak	Strong	N/A	Moderate

Table 3. Quality assessment of cross-sectional studies using the AXIS tool

Study	Comments
Buchholz, King, & Wray (2018)	Non-responders were not addressed or categorised and comparison between responders and non-responders was not reported. Funding sources and/or conflicts of interest were not commented upon
Dorflinger, Ruser, & Masheb (2017)	No comment on sample size justification; measures were not taken to address or categorise non-responders; there appeared to be some inconsistency between text and table data which was not clearly explained; and funding sources and/or conflicts of interest were not commented upon
Kimbrel et al. (2015)	No comment on sample size justification; funding sources and/or conflicts of interest were not commented upon
Litwack, Mitchell, Sloan, Reardon, & Miller (2014)	Funding sources and/or conflicts of interest were not commented upon; the study excluded participants using drugs/alcohol which may have affected representativeness of the target population; there appeared to be some inconsistency between text and table data which was not clearly explained; funding sources and/or conflicts of interest were not commented upon
Maguen et al. (2012a)	No comment on sample size justification; results did not appear to be presented for all analyses described in the method; funding sources and/or conflicts of interest were not commented upon
Maguen et al. (2012b)	No comment on sample size justification; funding sources and/or conflicts of interest were not commented upon
Mitchell, Rasmusson, Bartlett, & Gerber (2014)	No comment on sample size justification; funding sources and/or conflicts of interest were not commented upon
Mitchell & Wolf (2016)	No comment on sample size justification; measures were not taken to address or categorise non-responders; funding sources and/or conflicts of interest were not commented upon
Rosenbaum et al. (2016)	No comment on sample size justification; measures were not taken to address or categorise non-responders.

Appendix A: Submission guidelines for target journal *Eating Disorders: The Journal of Treatment and Prevention*

**Review Papers**

Should be written with the following elements in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list)

Should be between 6000 and 8000 words, inclusive of the abstract, tables, references, figure captions.

Should contain an unstructured abstract of 200 words.

We encourage submissions of review articles that are timely and relevant to clinicians and clinical researchers. Reviews should be systematic reviews or meta-analyses, and should follow a structured reporting format such as PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

**Style Guidelines**

Please refer to these quick style guidelines when preparing your paper, rather than any published articles or a sample copy.

Any spelling style is acceptable so long as it is consistent within the manuscript.

Any form of consistent quotation style is acceptable. Please note that long quotations should be indented without quotation marks.

Part of the mission of EDJTP is to disseminate cutting edge research on eating disorders to clinicians, academics, advocates, and sufferers. Thus, we have a social media editor, and we make it a priority to publicize articles through social media outlets. Authors can help generate publicity for their own articles by posting articles, or sharing EDJTP 's posts. (Find us on Twitter @Eating disordersJTP and Facebook.)

**Formatting and Templates**

Papers may be submitted in Word format. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting template(s).

Word templates are available for this journal. Please save the template to your hard drive, ready for use.

If you are not able to use the template via the links (or if you have any other template queries) please contact us here.

The journal's peer-review process follows the journal program guidelines of the American Psychological Association (APA), Publication Manual, 6th Edition. As this manual is updated, Eating Disorders will adjust its processes to accommodate alterations made to this manual. The APA website include a range of resources, such as An overview of the

Publication Manual of the American Psychological Association, Sixth Edition; and free tutorials on APA Style basics and an APA Style Blog. Note, manuscripts submitted that are not in APA style will not be sent to reviewers and will be returned to the authors. All submissions will be screened using duplication software. All manuscripts with scores higher than 12% will be returned to the authors for editing to reduce replicated material. The text should be presented in the following order: (1) Title Page, which should include the full names of all authors, the authors' institutional affiliations where the work was conducted, with a footnote for an author's present address if different to where the work was carried out, and any Acknowledgements (2) Abstract and Keywords. The abstract should be running text without subheadings. Please provide five to seven keywords. (3) Clinical Implications. Clinical Implications are required for each article, in keeping with our journal's mission of publishing research that is clinically applicable and practical. They consist of a short list of bullet points that convey the core findings and clinical implications of the article and should be submitted under the abstract in the online submission system. Please use 'Clinical Implications' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point; no acronyms). (4) Blinded Manuscript, which should include a title, a short running title of less than 40 characters, and the main text: double-spaced, with numbered manuscript pages (5) References (6) Tables, Figures, and Color Illustrations. Illustrations submitted (line drawings, halftones, photos, photomicrographs, etc.) should be clean originals or digital files. Digital files are recommended for highest quality reproduction and should follow these guidelines: 300 dpi or higher, sized to fit on journal page, EPS, TIFF, or PSD format only, submitted as separate files, not embedded in text files

**Checklist: What to Include**

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## Appendix B: Systematic literature review detailed search strategy

Search strategies for  
‘How does post-traumatic stress disorder relate to disordered eating in Military personnel and veterans? A systematic review’

Searches performed on 11 March 2019

Total number of references identified: 193  
Number of duplicates excluded: 77  
Number of references in final list: 116

Concept 1: Post-traumatic stress disorder
AND
Concept 2: Eating disorders
AND
Concept 3: Military personnel or veterans

PubMed (28 hits)

Concept 1
#1 MeSH: bulimia[MeSH Terms] OR bulimia nervosa[MeSH Terms] OR anorexia[MeSH Terms] OR anorexia nervosa[MeSH Terms] OR binge eating disorder[MeSH Terms] [22063 hits]
#2 Free-text words in Title/Abstract: anorexia[Title/Abstract] OR anorexia nervosa[Title/Abstract] OR "anorexia nervosa"[Title/Abstract] OR bulimia[Title/Abstract] OR bulimia nervosa[Title/Abstract] OR "bulimia nervosa"[Title/Abstract] OR binge eating disorder[Title/Abstract] OR "binge eating disorder"[Title/Abstract] OR eating disorder[Title/Abstract] OR "eating disorder"[Title/Abstract] OR "eating disorders"[Title/Abstract] [42628 hits]
#1 OR #2 = #3 [46923 hits]
Concept 2
# 4 MeSH: post traumatic stress disorders[MeSH Terms] [29528 hits]
# 5 Free-text words in Title/Abstract: PTSD[Title/Abstract] OR post traumatic stress[Title/Abstract] OR posttraumatic stress[Title/Abstract] [32795 hits]
#4 OR #5 = #6 [41379 hits]
Concept 3
#7 MeSH: military personnel[MeSH Terms] OR veterans[MeSH terms] [51103 hits]

#8 Free-text words in Title/Abstract: ((((((((((((((soldier\*[Title/Abstract]) OR (deployed[Title/Abstract] OR deployment[Title/Abstract])) OR active duty[Title/Abstract]) OR military[Title/Abstract]) OR veteran\*[Title/Abstract]) OR service member\*[Title/Abstract]) OR combat[Title/Abstract]) OR troop\*[Title/Abstract]) OR military[Title/Abstract]) OR service personnel[Title/Abstract]) OR army[Title/Abstract]) OR navy[Title/Abstract]) OR marine\*[Title/Abstract]) OR air force[Title/Abstract]) OR special forces[Title/Abstract] [234110 hits]

#7 OR #8 = #9 [244168 hits]

#3 AND #6 AND #9 = #10 [28 hits]

### CINAHL (17 hits)

#### Concept 1

#1 Free-text in Exact Subject Heading (after searching CINAHL headings; MH): (MH "Anorexia") OR (MH "Anorexia Nervosa") OR (MH "Binge Eating Disorder") OR (MH "Bulimia") OR (MH "Bulimia Nervosa") [8025 hits]

#2 Free-text words in Abstract (AB): AB anorexia OR AB anorexia nervosa OR AB "anorexia nervosa" OR AB bulimia OR AB bulimia nervosa OR AB "bulimia nervosa" OR AB binge eating disorder OR AB "binge eating disorder" OR AB eating disorder OR AB "eating disorder" OR AB "eating disorders" [11086 hits]

#1 OR #2 = #3 [14396 hits]

#### Concept 2

#4 Free-text in Exact Subject Heading (MH): MH Stress Disorders, Post-Traumatic [18924 hits]

#5 Free-text words in Abstract (AB): AB "PTSD" OR AB "post traumatic stress" OR AB "posttraumatic stress" [11616 hits]

#4 OR #5 = #6 [22175 hits]

#### Concept 3

#7 Free-text in Exact Subject Heading (after searching CINAHL headings; MH): MH Military Personnel OR MH Veterans [26029 hits]

#8 Free-text words in Abstract (AB): AB soldier\* OR AB deployed OR AB deployment OR AB active duty OR AB military OR AB veteran\* OR AB service member\* OR AB combat OR AB troop\* OR AB military OR AB service personnel OR AB army OR AB navy OR AB marine\* OR AB air force OR AB special forces [40480 hits]

#7 OR #8 = #9 [53312 hits]

#3 AND #6 AND #9 = #10 [17 hits]

## PsycINFO (42 hits)

Concept 1
#1 Free-text in Subject (after using Thesaurus; DE): DE "Anorexia Nervosa" OR DE "Binge Eating Disorder" OR DE "Bulimia" [17642 hits]
#2 Free-text words in Abstract (AB): AB anorexia OR AB anorexia nervosa OR AB "anorexia nervosa" OR AB bulimia OR AB bulimia nervosa OR AB "bulimia nervosa" OR AB binge eating disorder OR AB "binge eating disorder" OR AB eating disorder OR AB "eating disorder" OR AB "eating disorders" [32066 hits]
#3 Free-text words in Keyword (KW): KW anorexia OR KW anorexia nervosa OR KW "anorexia nervosa" OR KW bulimia OR KW bulimia nervosa OR KW "bulimia nervosa" OR KW binge eating disorder OR KW "binge eating disorder" OR KW eating disorder OR KW "eating disorder" OR KW "eating disorders" [24248 hits]
#1 OR #2 OR #3 = #4 [35453 hits]
Concept 2
#5 Free-text in Subject (after using Thesaurus; DE): DE "Posttraumatic Stress Disorder" [30289 hits]
#6 Free-text words in Abstract (AB): AB "PTSD" OR AB "post traumatic stress" OR AB "posttraumatic stress" [39409 hits]
#7 Free-text words in Keyword (KW): KW "PTSD" OR KW "post traumatic stress" OR KW "posttraumatic stress" [28309 hits]
#5 OR #6 OR #7 = #8 [42794 hits]
Concept 3
#9 Free-text in Subject (after using Thesaurus; DE): DE Military personnel OR DE Military veterans [24254 hits]
#10 Free-text words in Abstract (AB): AB soldier* OR AB deployed OR AB deployment OR AB active duty OR AB military OR AB veteran* OR AB service member* OR AB combat OR AB troop* OR AB military OR AB service personnel OR AB army OR AB navy OR AB marine* OR AB air force OR AB special forces [67774 hits]
#11 Free-text words in Keyword (KW): KW soldier* OR KW deployed OR KW deployment OR KW active duty OR KW military OR KW veteran* OR KW service member* OR KW combat OR KW troop* OR KW military OR KW service personnel OR KW army OR KW navy OR KW marine* OR KW air force OR KW special forces [33756 hits]
#9 OR #10 OR #11 = #12 [73372 hits]
#4 AND #8 = #9 [42 hits]

## Web of Science (65 hits)

Concept 1
#1 Free-text in Topic (TS): TS=(anorexia OR "anorexia nervosa" OR bulimia OR "bulimia nervosa" OR "eating disorder" OR "eating disorders" OR "binge eating disorder") [52792 hits]
Concept 2
#2 Free-text in Topic (TS): TS=(PTSD OR post traumatic stress OR "post traumatic stress" OR posttraumatic stress OR "posttraumatic stress") [58638 hits]
Concept 3
#3 Free-text in Topic (TS): TS=(soldier* OR deployed OR deployment OR active duty OR military OR veteran* OR service member* OR combat OR troop* OR military OR service personnel OR army OR navy OR marine* OR air force OR special forces) [937612 hits]
#1 AND #2 AND #3 = #4 [65 hits]

## Cochrane Central Register of Controlled Trials (2 hits)

Concept 1
#1 MeSH descriptor: [Bulimia] explode all trees [453 hits]
#2 MeSH descriptor: [Bulimia Nervosa] explode all trees [226 hits]
#3 MeSH descriptor: [Anorexia] explode all trees [329 hits]
#4 MeSH descriptor: [Anorexia Nervosa] explode all trees [463 hits]
#5 MeSH descriptor: [Binge Eating Disorder] explode all trees [195 hits]
#6 anorexia:ti,ab,kw [4272 hits]
#7 anorexia nervosa:ti,ab,kw [874 hits]
#8 "anorexia nervosa":ti,ab,kw [863 hits]
#9 bulimia:ti,ab,kw [1098 hits]
#10 bulimia nervosa:ti,ab,kw [743 hits]
#11 "bulimia nervosa":ti,ab,kw [697 hits]
#12 binge eating disorder:ti,ab,kw [661 hits]
#13 "binge eating disorder":ti,ab,kw [535 hits]
#14 eating disorder:ti,ab,kw [1713 hits]

#15 “eating disorder”:ti,ab,kw [1391 hits]
#16 “eating disorders”:ti,ab,kw [1216 hits]
#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 or #16 = #17 [6593 hits]
Concept 2
#18 MeSH descriptor: [Stress Disorders, Post Traumatic] explode all trees [2119 hits]
#19 PTSD:ti,ab,kw [2932 hits]
#20 post traumatic stress:ti,ab,kw [2873 hits]
#21 “post traumatic stress”:ti,ab,kw [1143 hits]
#22 posttraumatic stress:ti,ab,kw [3985 hits]
#23 “posttraumatic stress”:ti,ab,kw [3423 hits]
#18 OR #19 OR #20 OR #21 OR #22 OR #23 = #24 [4575 hits]
#25 MeSH descriptor: [Military Personnel] explode all trees [850 hits]
#26 MeSH descriptor: [Veterans] explode all trees [822 hits]
#27 (soldier*):ti,ab,kw [668 hits]
#28 (deployed):ti,ab,kw [553 hits]
#29 (deployment):ti,ab,kw [866 hits]
#30 (active duty):ti,ab,kw [336 hits]
#31 (military):ti,ab,kw [2453 hits]
#32 (veteran*):ti,ab,kw [4528 hits]
#33 (service member*):ti,ab,kw [1060 hits]
#34 (combat):ti,ab,kw [1251 hits]
#35 (troop*):ti,ab,kw [65 hits]
#36 (military):ti,ab,kw [160 hits]
#37 (service personnel):ti,ab,kw [1262 hits]
#38 (army):ti,ab,kw [717 hits]
#39 (navy):ti,ab,kw [220 hits]
#40 (marine*):ti,ab,kw [546 hits]
#41 (air force):ti,ab,kw [287 hits]

#42 (special forces):ti,ab,kw [54 hits]
#25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 = #43 [11673 hits]
#17 AND #24 and #43 = #44 [2 hits]

## EMBASE (39 hits)

Concept 1
#1 Subject Headings: (bulimia or bulimia nervosa or anorexia or anorexia nervosa or binge eating disorder).sh [84322 hits]
#2 Free-text words in Title: (anorexia OR anorexia nervosa OR bulimia OR bulimia nervosa OR binge eating disorder OR eating disorder).ti [18568 hits]
#3 Free-text words in Abstract: (anorexia OR anorexia nervosa OR bulimia OR bulimia nervosa OR binge eating disorder OR eating disorder).ab [44648 hits]
#1 OR #2 OR #3 = #4 [96358 hits]
Concept 2
# 5 Subject Headings: posttraumatic stress disorder [53090 hits]
# 6 Free-text words in Title: (PTSD OR post traumatic stress OR posttraumatic stress).ti [20637 hits]
#7 Free-text words in Abstract: (PTSD OR post traumatic stress OR posttraumatic stress).ab [37944 hits]
#5 OR #6 OR #7 = #8 [57973 hits]
Concept 3
#9 Subject headings: (army OR veteran).sh [35113 hits]
#10 Free-text words in Title: (soldier* or deployed or deployment or active duty or military or veteran* or service member* or combat or troop or military or service personnel or army or navy or marine* or air force or special forces).ti [89115 hits]
#11 Free-text words in Abstract: (soldier* or deployed or deployment or active duty or military or veteran* or service member* or combat or troop or military or service personnel or army or navy or marine* or air force or special forces).ab [232552 hits]
#9 OR #10 OR #11 = #12 [265231 hits]
#4 AND #8 AND #12 = #13 [39 hits]

Appendix C: Quality appraisal tool (Effective Public Health Practice Project tool; EPHPP tool)



**QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES**

**COMPONENT RATINGS**

**A) SELECTION BIAS**

**(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?**

- 1 Very likely
- 2 Somewhat likely
- 3 Not likely
- 4 Can't tell

**(Q2) What percentage of selected individuals agreed to participate?**

- 1 80 - 100% agreement
- 2 60 - 79% agreement
- 3 less than 60% agreement
- 4 Not applicable
- 5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

**B) STUDY DESIGN**

**Indicate the study design**

- 1 Randomized controlled trial
- 2 Controlled clinical trial
- 3 Cohort analytic (two group pre + post)
- 4 Case-control
- 5 Cohort (one group pre + post (before and after))
- 6 Interrupted time series
- 7 Other specify \_\_\_\_\_
- 8 Can't tell

**Was the study described as randomized? If NO, go to Component C.**

- No
- Yes

**If Yes, was the method of randomization described? (See dictionary)**

- No
- Yes

**If Yes, was the method appropriate? (See dictionary)**

- No
- Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

**C) CONFOUNDERS****(Q1) Were there important differences between groups prior to the intervention?**

- 1 Yes
- 2 No
- 3 Can't tell

**The following are examples of confounders:**

- 1 Race
- 2 Sex
- 3 Marital status/family
- 4 Age
- 5 SES (income or class)
- 6 Education
- 7 Health status
- 8 Pre-intervention score on outcome measure

**(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?**

- 1 80 – 100% (most)
- 2 60 – 79% (some)
- 3 Less than 60% (few or none)
- 4 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

**D) BLINDING****(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?**

- 1 Yes
- 2 No
- 3 Can't tell

**(Q2) Were the study participants aware of the research question?**

- 1 Yes
- 2 No
- 3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

**E) DATA COLLECTION METHODS****(Q1) Were data collection tools shown to be valid?**

- 1 Yes
- 2 No
- 3 Can't tell

**(Q2) Were data collection tools shown to be reliable?**

- 1 Yes
- 2 No
- 3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3



**F) WITHDRAWALS AND DROP-OUTS****(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?**

- 1 Yes
- 2 No
- 3 Can't tell
- 4 Not Applicable (i.e. one time surveys or interviews)

**(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).**

- 1 80 -100%
- 2 60 - 79%
- 3 less than 60%
- 4 Can't tell
- 5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

**G) INTERVENTION INTEGRITY****(Q1) What percentage of participants received the allocated intervention or exposure of interest?**

- 1 80 -100%
- 2 60 - 79%
- 3 less than 60%
- 4 Can't tell

**(Q2) Was the consistency of the intervention measured?**

- 1 Yes
- 2 No
- 3 Can't tell

**(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?**

- 4 Yes
- 5 No
- 6 Can't tell

**H) ANALYSES****(Q1) Indicate the unit of allocation (circle one)**

community    organization/institution    practice/office    individual

**(Q2) Indicate the unit of analysis (circle one)**

community    organization/institution    practice/office    individual

**(Q3) Are the statistical methods appropriate for the study design?**

- 1 Yes
- 2 No
- 3 Can't tell

**(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?**

- 1 Yes
- 2 No
- 3 Can't tell

**GLOBAL RATING****COMPONENT RATINGS**

Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

<b>A</b>	<b>SELECTION BIAS</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
<b>B</b>	<b>STUDY DESIGN</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
<b>C</b>	<b>CONFOUNDERS</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
<b>D</b>	<b>BLINDING</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
<b>E</b>	<b>DATA COLLECTION METHOD</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
<b>F</b>	<b>WITHDRAWALS AND DROPOUTS</b>	<b>STRONG</b>	<b>MODERATE</b>	<b>WEAK</b>
		1	2	3
				Not Applicable

**GLOBAL RATING FOR THIS PAPER (circle one):**

- |   |          |                            |
|---|----------|----------------------------|
| 1 | STRONG   | (no WEAK ratings)          |
| 2 | MODERATE | (one WEAK rating)          |
| 3 | WEAK     | (two or more WEAK ratings) |

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No      Yes

If yes, indicate the reason for the discrepancy

- |   |   |
|---|---|
| 1 | Oversight                                 |
| 2 | Differences in interpretation of criteria |
| 3 | Differences in interpretation of study    |

**Final decision of both reviewers (circle one):**

- |          |                 |
|----------|-----------------|
| <b>1</b> | <b>STRONG</b>   |
| <b>2</b> | <b>MODERATE</b> |
| <b>3</b> | <b>WEAK</b>     |

## Appendix D: Quality appraisal tool (Appraisal tool for cross-sectional studies; AXIS tool)

## Appraisal of Cross-sectional Studies

	Question	Yes	No	Don't know/ Comment
<b>Introduction</b>				
1	Were the aims/objectives of the study clear?			
<b>Methods</b>				
2	Was the study design appropriate for the stated aim(s)?			
3	Was the sample size justified?			
4	Was the target/reference population clearly defined? (Is it clear who the research was about?)			
5	Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?			
6	Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?			
7	Were measures undertaken to address and categorise non-responders?			
8	Were the risk factor and outcome variables measured appropriate to the aims of the study?			
9	Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?			
10	Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)			
11	Were the methods (including statistical methods) sufficiently described to enable them to be repeated?			
<b>Results</b>				
12	Were the basic data adequately described?			
13	Does the response rate raise concerns about non-response bias?			
14	If appropriate, was information about non-responders described?			
15	Were the results internally consistent?			
16	Were the results presented for all the analyses described in the methods?			
<b>Discussion</b>				
17	Were the authors' discussions and conclusions justified by the results?			
18	Were the limitations of the study discussed?			
<b>Other</b>				
19	Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?			
20	Was ethical approval or consent of participants attained?			

## **Section Two: Research Paper**

The effect of fear of compassion on self-criticism and eating disordered behaviour

Word count (excluding references, tables and appendices): 7,586

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Prepared in accordance with notes for contributors for *Eating Disorders: The Journal of Treatment and Prevention*<sup>1</sup>

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<sup>1</sup> see Appendix A for submission guidelines

## **The effect of fear of compassion on self-criticism and eating disordered behaviour**

Self-criticism is a prominent therapeutic target in the field of eating disorders and is significantly associated with disordered eating; ability to receive compassion has been shown to moderate this relationship. However, the experience of compassion from the self or others can trigger aversive responses known as ‘fear of compassion’. The current study used mediation analysis to test a theoretical model that self-criticism contributes to disordered eating behaviour indirectly through fear of compassion to self and from others. One hundred and thirty seven adults completed measures of self-criticism, fear of compassion, and disordered eating in an online survey. Significant indirect effects of higher levels self-criticism on increased levels of disordered eating through fear of receiving compassion from others or from the self were identified. The findings of the current study elucidate processes related to fear of receiving compassion, either internally from the self or externally from others, as a potentially key mechanism underpinning the relationship between self-criticism and disordered eating behaviours. Clinical implications for engagement and therapeutic progress for individuals experiencing disordered eating are discussed including a need for early assessment of fear of compassion, particularly in those known to be self-critical.

**Keywords:** Self-criticism; fear of compassion; disordered eating; mediation

### **Introduction**

The concept of self-criticism is broadly defined as a process of self-evaluation and is considered to be experienced universally (Whelton & Greenberg, 2005) assuming a number of forms and functions ranging from healthy and reflexive to harmful and dysfunctional (Kannan & Levitt, 2017). Whelton and Henkelman (2002) describe two types of self-critical processes which they categorised as positive, representing concern for and a desire to protect the self, and negative, including self-attack and condemnation. Gilbert, Clarke, Hempel, Miles, and Irons

(2004) reiterate this distinction in describing a potentially adaptive function of self-criticism which relates to self-correction in a bid to improve one's performance, in contrast with more harmful functions of self-criticism linked to self-denigration, disgust, and self-hatred.

Although there appears to be consensus regarding more positive and less helpful functions of self-criticism, measuring the construct in both clinical and research contexts poses some challenges. Whilst early theories related to self-criticism tended to see self-criticism as a single process (Beck et al., 1979), a recent review highlighted multiple conceptualisations of self-criticism measured by currently available scales. These included self-criticism as a dispositional tendency or trait, as a habitual or ruminative cognitive style, an emotional regulation strategy, and as a response to a difficult event (Rose & Rimes, 2018). Gilbert (2009) argues that self-criticism represents evolved competencies that are adapted in order to regulate relationships with others and later become internalised in the subjective self-to-self relationship. For example, caregivers may use criticism in an attempt to improve children's behaviour, which is later internalised as self-criticism with an aim of correcting one's own behaviour. Conversely, persecutory criticism from others with a function of attacking out-groups or those seen as harmful may be internalised as a more harmful form of self-criticism wherein the self is construed as contemptible or bad (Gilbert, Clark, Hempel, & Irons, 2004).

More harmful forms of self-criticism have been linked to negative mood states including shame, contempt, and self-disgust (Gilbert, 2004). Clinical and research interests have focused on this form of self-criticism which is characterised by persistence and hostility, and is considered to be problematic and self-destructive. Extensive research has shown that self-criticism is associated with a range of psychological difficulties including depression (Dinger et al., 2014; Dunkley, Stanislav, Grilo, & McGlashan, 2009; Ehret, Joorman, & Berking, 2014; Kopala-Sibley, Zuroff, Hankin, & Abela, 2015), paranoid ideation (Carvalho, Sousa, & da Motta, 2019), proneness to shame (Gilbert & Miles, 2000), self-harm (Xavier,

Pinto Gouveia, & Cunha, 2016), social anxiety (Iancu, Bodner, & Ben-Zion, 2015; Shahar, Doron, & Szepsenwol, 2015), and disordered eating (Duarte, Ferreira, & Pinto-Gouveia, 2016; Fennig et al., 2008; Thew, Gregory, Roberts, & Rimes, 2017). The degree to which self-criticism is addressed has been linked with success of interventions (Marshall, Zuroff, McBride, & Bagby, 2008; Rector, Bagby, Segal, Joffe, and Levitt, 2000). It is recognised as a potential barrier to therapeutic change and therefore a critical factor for addressing in therapy (Kannan & Levitt, 2013).

Psychological interventions often acknowledge self-criticism as an important factor to be considered in the development and maintenance of psychological distress. With this in mind, compassion focused therapy (CFT) was created for individuals with mental health difficulties with a particular focus on shame and self-criticism (Gilbert, 2004). CFT has expanded upon other evidence-based interventions such as cognitive behavioural therapy (CBT), retaining fundamental cognitive and behavioural principles whilst incorporating Eastern philosophies and a neuroscientific understanding of affect regulation. In CFT, the ‘three systems’ model comprises ‘threat’, ‘drive’, and ‘soothing’ affect regulation systems, each of which developed for specific evolutionary functions (Gilbert, 2004). Activation of each system facilitates the rapid enactment of relevant emotional and behavioural responses linked to human survival. The threat system serves a protective function through the initiation of anger, anxiety, disgust, and the ‘flight, flight, freeze, or submit’ response. Excitement and other reward-based emotions in addition to motivation to achieve, engage, and approach are associated with the drive system. The soothing system triggers feelings of contentment and well-being, promoting reciprocal affiliation and affection with an aim of creating soothing experiences and social connectedness.

Self-criticism is a prominent therapeutic target in the field of eating disorders and is significantly associated with disordered eating (Dunkley, Stanislow, Grilo, & McGlashan, 2009; Fennig et al., 2008; Porter, Zelkowitz, & Cole, 2018; Oliveira, Ferreira, Mendes, &

Marta-Simões, 2017). Cognitive behavioural theories suggest that core transdiagnostic issues relevant to eating disorders are evaluation of self-worth being disproportionately linked to judgments about shape, weight, or eating habits (Fairburn, Cooper, & Shafran, 2003). Beliefs about and attempts to control shape, weight, and eating are typically manifested in extreme behaviours such as dietary restraint, self-induced vomiting, over-exercising, misuse of laxatives, and body checking. In line with this framework, CFT was adapted for individuals with eating disorders (CFT-E) and to address the psychological, biological, and social challenges of recovering from eating disorders. The approach theorises that the threat system is triggered in relation to appearance, eating, and interoceptive experiences of hunger or fullness (Goss & Allan, 2014) leading to self-critical, shame, disgust, and self-hostility responses. As a way of down-regulating the activated threat system, the drive system is engaged in an attempt to induce positive feelings of pride and achievement through self-denial, successful adherence to dietary rules, weight loss, or defiance of hunger. In this context, it is also proposed that the soothing system may be linked to certain foods or the actual experience of eating, which may become problematic and bring unintended consequences, particularly where it is the sole mechanism for achieving self-soothing and more adaptive soothing strategies are not developed or inaccessible.

Ability to receive compassion has been shown to moderate the effect of self-criticism on disordered eating (Hermanto et al., 2016). A key aim of CFT and CFT-E is therefore to increase the capacity of the soothing systems to promote more adaptive experiences of positive affiliation and self-soothing as a way to counteract self-criticism and over-active threat and drive systems. Compassion-based approaches aim to achieve an adaptive form of self-to-self relating through compassionate mind techniques including compassionate letter writing, loving-kindness meditation, mindfulness, and compassionate imagery (Gilbert & Procter, 2006).



Gilbert (2009) describes three directions or ‘flows’ of compassion within interpersonal and intrapersonal relating; showing compassion to others, receiving compassion from others, and having compassion towards the self. Difficulties may arise within any of these directional processes bringing about a fear of compassion wherein aversive responses result from giving or receiving support, kindness, or care (Gale, Gilbert, Read, & Goss, 2014; Gilbert, McEwan, Matos, Ravis, 2011). Receiving compassion either from the self or others may be foreign and unfamiliar, it may trigger memories of lack of or uncertainty of care, feelings of worthlessness, or fears about dependency, weakness, or loss of standards (Hermanto et al., 2016). This is suggested to be particularly relevant to individuals with traumatic or neglectful backgrounds (Gilbert, McEwan, Matos, Ravis, 2011). The intended soothing experience of compassion is not guaranteed either. For example, people higher in self-criticism showed decreased heart-rate variability and no reduction in cortisol levels, both physiological indicators of threat-defensive behaviours and stress, in response to compassion-focused imagery as compared with controls (Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008). One of the earliest opportunities in life to experience compassion is through the act of being fed and nurtured by caregivers and, later, feeding and taking care of ourselves. If this experience was absent, harmful, or fear-inducing, as a consequence, it makes sense that individuals with difficulties in their relationship with food or eating might also experience related stimuli as triggering of negative states. Fear of showing compassion towards others, however, appears to have different theoretical underpinnings. For example, rather than a threat response triggered by receipt of compassion which is potentially grounded in adverse early experiences or fears of loss of control or standards, fear of showing compassion has been suggested to relate to: negative concept of others, threats to the interests of the self or one’s group, or conservation of compassion as a resource (Jazaieri et al., 2013). Furthermore, the research in relation to fear of compassion from others is less abundant with early ideas focusing more on lack of compassion towards others

rather than fear. Examples include: a lack of compassion towards others arising when others are perceived as undeserving of compassion, contemptible due to their actions, or as belonging to an out-group; confusion between compassion and weakness or submissiveness; or a fear of compassion towards others due to the distress of others giving rise to anxiety responses (Batson, Klein, Highberger, & Shaw, 1995; Berndsen & Feather, 2016; Feeney & Collins, 2001; Gilbert, McEwan, Matos, Ravis, 2011; Mikulincer, Shaver, Gillath, & Nitzberg, 2005).

Experiences of abuse, neglect, and being shamed by caregivers are common among individuals with eating disorders (Brewerton, 2007; Caslini et al., 2016). The processes of receiving compassion from others or showing compassion to oneself can therefore be experienced as threatening by this group. In their research with eating disorder populations, Kelly, Carter, Zuroff, and Boriari (2013) examined a transdiagnostic group of individuals attending an interdisciplinary hospital treatment programme. They found that higher levels of fear of compassion to self were associated with higher levels of shame and greater eating disorder severity. Moreover, they identified lower levels of self-compassion interacted with higher levels of fear of compassion to self, negatively impacting treatment response. In line with these findings, fear of compassion to self has been identified as a strong predictor of severity of eating disorder symptoms (Kelly, Vimalakanthan, & Carter, 2014). Oliveira, Ferreira, Mendes, and Marta-Simões (2017) explored the relationships between shame, self-judgment, fears of receiving compassion from others, and disordered eating in a general population sample. They identified a strong relationship between shame and fear of compassion from others and shame was positively associated with overall levels of disordered eating. These results fits with CFT theory wherein aspects of disordered eating are interpreted as ways of attempting to feel better and down-regulate feelings of shame, self-criticism, or self-hostility triggered by the threat system.

In summary, whilst it is possible that self-criticism and fear of compassion are reciprocal or inter-related constructs, the model is arranged as it is based on theory concerning the origins of self-criticism as a self-to-self relationship based on early experience. Gilbert and Irons (2008) suggest that self-criticism often develops in the context of harsh, cold, or critical caregiving or peer relationships. They suggest that this later affects an individual's developing ability to accept compassion from others and generate self-compassion as an adaptive self-soothing 'antidote' to self-criticism. Self-critical individuals may therefore experience compassion as fear- or anxiety-provoking and consequently they may use their relationship with food and eating, manifested in disordered eating, as an emotional regulation strategy in order to cope and alleviate distress. The current study sought to test this theoretical model that self-criticism contributes to disordered eating behaviour indirectly through fear of compassion to self and from others as illustrated by Figure 1 below.

[FIGURE 1 NEAR HERE]

The main hypothesis was that there would be an indirect relationship between self-criticism and disordered eating mediated by fear of receiving compassion to self or from others but not by showing compassion to others. Essentially, this was expected to be demonstrated by individuals with higher levels of self-criticism presenting with greater levels of disordered eating behaviours due to experiencing fear of compassion to self and from others, but not fear of compassion towards others. A group of individuals across the full range of severity of disordered eating (i.e. those from clinical and non-clinical populations), without focus on any particular eating disorder diagnosis, was chosen in line with the move towards transdiagnostic theories and interventions for eating disorders (Cooper & Dalle Grave, 2017; Thompson-Brenner, Boswell, Espel-Huynh, Brooks, & Lowe, 2018). Given the different conceptualisations of self-criticism, this study employed two measures considered to be potentially relevant to individuals across the range of severity of disordered eating measuring

a total of three different forms of self-criticism. One global perhaps more widely applicable scale designed to assess self-critical rumination and another, perhaps more relevant to the clinical population, to assess self-criticism in terms of self-hatred and a sense of inadequacy in response a perceived failure.

The aim of the study was to assess the indirect effects of three different forms of self-criticism on disordered eating behaviours through the three ‘flows’ of compassion using a quantitative cross-sectional survey design.

Study hypotheses were as follows:

- (1) An indirect effect of self-criticism (as a ruminative thinking style; in relation to a sense of personal inadequacy; and, as a form of self-hatred) would be observed on disordered eating behaviour through fear of compassion to self and fear of compassion from others
- (2) No indirect effect of self-criticism (as a ruminative thinking style; in relation to a sense of personal inadequacy; and, as a form of self-hatred) would be observed on disordered eating behaviour through fear of compassion to others

## **Method**

### ***Design***

### ***Participants***

Participants were recruited between 1<sup>st</sup> March and 19<sup>th</sup> April 2019. Eligibility criteria were: English-speaking adults, aged 18 years or over, of any gender, able to access and complete an online survey and, based in the United Kingdom. In order to achieve a wide distribution of scores on measures of disordered eating participants were not required to fulfil specific criteria in relation to having an eating disorder diagnosis or experience of disordered eating behaviours.

### *Procedure*

The study received ethical approval from Lancaster University's Faculty of Health and Medicine Research Ethics Committee. Feedback on study design was obtained from experts by experience from the UK-based eating disorders charity 'Beat' and suggested changes were included in the final design. Participants were respondents to an anonymous online survey which was promoted using a study advertisement circulated on social media. Although participants were not directed to share the study advertisement, it is likely that some were recruited through incidental snowball sampling. Key stakeholders were asked to circulate the study advertisement; these included the eating disorder charity Beat, academic researchers and establishments linked to research in compassion and eating disorders, and public ambassadors and champions for people with lived experience of eating disorders.

Prior to the beginning of the survey participants completed a consent form electronically and indicated that they had read the participant information sheet fully informing them of the nature and procedures of the study. They were informed that the purpose of the study was to examine the relationship between fear of compassion, self-criticism, and disordered eating behaviour. After completing the survey, participants were shown information regarding supportive resources for those with concerns about themselves or others in relation to disordered eating or mental health. Full details of the study procedure and ethical approval are included in Section 4.

Respondents entered sociodemographic information related to gender, age, ethnicity, occupational and partnership status, and answered three eating disorder specific questions which included follow up questions where appropriate (indicated in parentheses). The questions were: (1) 'Have you ever been given an eating disorder diagnosis? (If so, which?)' (2) 'Do you identify with any of the eating disorder diagnoses? (If so, which?)' and (3) 'Have

you ever been hospitalised as a result of an eating disorder?’. Respondents were able to choose from a range of options in a drop-down menu for all of the sociodemographic and disordered eating specific questions which included a ‘prefer not to say’ for each question. They were then asked to complete five standardised questionnaires which were related to self-criticism, fear of compassion, disordered eating symptomatology, and mood. At the end of the survey, participants were offered the option to enter a prize draw for an opportunity to win one of four £50 Amazon vouchers. This information was gathered separately to the main survey in order to maintain participants’ anonymity.

### ***Measures***

#### *Self-Critical Rumination Scale (SCRS)*

The SCRS (Smart, Peters & Baer, 2015) was chosen based upon a recent systematic review of tools designed to measure self-criticism (Rose & Rimes, 2018). This 10-item self-report questionnaire was designed to assess maladaptive forms of repetitive cognitions linked to negative self-evaluation in addition to aspects of the content of these thoughts and the frequency of occurrence (e.g. “Sometimes it is hard for me to shut off critical thoughts about myself”). Items are rated on a 4-point Likert scale ranging from ‘1’ (“Not at all”) to ‘4’ (“Very well”). A final score is determined through calculating the average of all ten items, with higher scores being indicative of higher levels of self-critical rumination. The SCRS was recommended for research use as the methodological quality of its development was rated as excellent, it received positive ratings for content validity, test-retest reliability was rated as high, structural validity was rated as moderate, and it demonstrates excellent internal consistency (Cronbach’s alpha = .92; Rose & Rimes, 2018). Cronbach’s alpha for this study was .93.

#### *Forms of Self-Criticism and Self-Reassurance Scale (FSCRS)*

The FSCRS (Gilbert, Clark, Hempel, Miles & Irons, 2004) was also recommended by Rose and Rime's (2018) review for similar reasons. The FSCRS is a 22-item self-report questionnaire was developed in order to assess different ways individuals respond to a perceived negative event. In particular, it examines three factors: self-criticism in the form of a personal sense of inadequacy (e.g. "There is a part of me that feels I am not good enough"); self-criticism in the form of self-persecution and hatred (e.g. "I call myself names"); and, self-reassurance (e.g. "I am able to remind myself of positive things about myself"). Items are rated on a 5-point Likert scale ranging from '0' ("Not at all like me") to '4' ("Extremely like me"). Scores for three subscales 'Inadequate self', 'Hated self', and 'Reassured self' can be calculated along with a global score. The scale has been shown to have good psychometric properties including good reliability and internal consistency in clinical and non-clinical populations (Cronbach's alpha between .85 and .91 for all three scales; Baião, Gilbert, McEwan, & Carvalho, 2015). Cronbach's alphas for the current study were .93, .88, and .91, for 'Inadequate self', 'Hated self', and 'Reassured self' scales respectively.

#### *Fears of Compassion Scale (FOCS)*

The FOCS (Gilbert, McEwan, Matos & Ravis, 2011) is a 38-item self-report questionnaire designed to assess whether individuals experience difficulties in showing and/or receiving compassion. It consists of three subscales namely 'fear of compassion to self' (e.g. "I fear that if I am more self-compassionate I will become a weak person"), 'fear of compassion from others' (e.g. "Feelings of kindness from others are somehow frightening"), and 'fear of compassion for others' (e.g. "People will take advantage of me if they see me as too compassionate"). Items are rated on a 5-point Likert scale ranging from '0' ("Don't agree at all") to '4' ("Completely agree"). The scale has demonstrated good construct validity and high internal consistency with Cronbach's alphas being 0.85 for fear of compassion for self; 0.87 for fear of compassion from others, and 0.78 for fear of compassion for others (Gilbert,

McEwan, Matos & Ravis, 2011). Cronbach's alphas for the current study were .95 for fear of compassion to self, .95 for fear of compassion from others, and .86 for fear of compassion for others.

#### *Eating Disorder Examination Questionnaire (EDE-Q)*

The EDE-Q (Fairburn & Beglin, 1994) is a well-validated and widely used self-report measure designed to assess ED symptomatology. It is composed of 28 items exploring disordered eating attitudes and behaviours over the last 28 days. Most items are rated on a 7-point Likert scale ranging from '0' to '6' with higher scores indicating greater severity or frequency, with the exception of six items requiring the respondent to input a numerical value for frequency. All items except these six contribute to four subscales: 'Restraint', 'Eating Concern', 'Shape Concern', and 'Weight Concern', plus a global score. EDE-Q subscales and global measure have demonstrated good internal consistency (Berg, Peterson, Frazier, & Crow, 2012). Previous Cronbach's alpha was calculated to be .90 for the global score (Rose, Vaewsorn, Rosselli-Navarra, Wilson, & Weissman, 2013). For the current study, Cronbach's alpha was .96 for the global score.

#### *Depression, Anxiety, and Stress Scale (DASS-21)*

The DASS-21 is a self-report measure designed to assess perceived severity of symptoms related to depression, anxiety, and stress using 21 items each rated on a Likert scaled ranging between '0' ("never") and '4' ("almost always"). It is well validated amongst clinical and non-clinical populations (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005). The seven items related to depression were used in the current study to contribute to the definition of sample characteristics. As the primary focus of the mediation analyses was the relationships between self-criticism, fear of compassion and disordered eating, the inclusion of a measure of depression within these models, potentially as an alternative outcome variable in



place of disordered eating in order to replicate previous studies, was considered beyond the scope of the current study.

### *Data analysis*

Outliers were identified and examined individually. Assumptions of linear regression were tested including linearity, homoscedasticity, and normal distribution of residuals. Data were explored visually, using P-P and Q-Q plots, and statistically tested for skewness and kurtosis (Field, 2018).

### *Outliers*

Outliers were initially identified visually using histograms. Absolute values for  $z$ -scores were then calculated for each variable in order to test whether they were broadly consistent with what would be expected within a normal distribution i.e. 95% in the ‘normal’ range, 5% ‘potential’ outliers with  $z$ -scores of  $> 1.96$ , 1% ‘probable’ outliers with  $z$ -scores of  $> 2.58$ , and very few cases with ‘extreme’  $z$ -scores of  $> 3.29$  (Field, 2018). This allowed identification of a greater than expected percentage of probable outliers (2.1%) on the SCRS involving three cases. These cases included low SCRS scores. Sensitivity analyses were performed and revealed results similar to those from primary analyses. Furthermore, ‘Winsorising’ SCRS data had little effect on the mean and standard deviation for the scale. Original data were therefore retained.

### *Skewness and kurtosis*

Scores for skewness and kurtosis were divided by their standard error in order to calculate  $z$ -scores.  $Z$ -scores greater than 1.96 were deemed significant ( $p < 0.05$ ; Field, 2018). Skewness was identified for SCRS, FSCRS inadequate self, and FSCRS reassured self. Kurtosis was identified for FOCS from others, FOCS to self, FSCRS hated self, EDE-Q restraint, EDE-Q

eating concern, EDE-Q weight concern, and EDE-Q global. Non-parametric tests were therefore employed for correlation analyses.

#### *Linearity and homoscedasticity*

Relationships between the standardised predicted and residual values for response and predictor variables were plotted and examined visually using scatterplots fitted with loess curves. Relationships between all response and predictor variables to be entered as part of mediation analyses (i.e.  $X$  predicting  $Y$ ,  $X$  predicting  $M$ ,  $M$  predicting  $Y$ , and  $X$  and  $M$  predicting  $Y$ ) were deemed to be roughly linear and around zero. Data points were randomly and evenly dispersed equally throughout the plot and did not follow a funnel or curvilinear pattern. Assumptions of linearity and homoscedasticity therefore appeared to be satisfied (Field, 2018).

#### *Normality of residuals*

Q-Q plots of standardised predicted and residual values for response and predictor variables were generated and examined visually; data fit well with the diagonal lines suggesting normality of residuals (Kane & Ashbaugh, 2017).

#### *Statistical analysis*

Descriptive statistics were calculated in order to examine basic data characteristics and zero order correlations were performed on all variables.  $T$ -tests were used to test for between group differences for participants scoring above and below the clinical cut-off score ( $\geq 4$ ) on the EDE-Q.

Finally, a linear regression-based approach based on Hayes' method (2018) was used to test for an indirect effect using Hayes' (2017) PROCESS tool Version 3.3 within SPSS Version 25 (IBM, 2017). For adequate power (0.80), a minimum sample size of 71 was determined based on medium effect sizes for both paths (i.e.  $a$  and  $b$ ) of the mediation model

using a bias-corrected bootstrap method with 5,000 replications (Fritz & MacKinnon, 2007). Use of bootstrapping and Hayes' method promotes robustness to the above detailed violations of assumptions (Hayes, 2018).

In all models, disordered eating as measured by the 'EDE-Q Global' score was used as the dependent variable (DV) and the three types of fear of compassion (to self, from others, and to others, as measured by 'FOCS to self', 'FOCS from others', and 'FOCS to others' respectively) were tested as mediators. In Models 1-3, self-criticism as measured by the 'SCRS' was used as the independent variable (IV). In Models 4-6, self-criticism as measured by the FSCRS 'Inadequate self' subscale was the IV. Finally, in Models 7-9, self-criticism as measured by the FSCRS 'Hated self' subscale was used as the IV.

## **Results**

### *Participant characteristics*

A total of 147 participant responses to the survey were recorded of which one displayed an unusual response pattern (scoring '1' for each item on every measure) and 11 contained missing data. Data from the participant with an unusual response pattern was excluded leaving 146 responses. In nine of the 11 responses containing missing data, participants had not responded to any items on two or more of the scales including the EDE-Q. Welch's t-tests did not reveal any differences between the nine sets of data and the remaining sample therefore they were also excluded leaving 137 responses. The remaining two responses with missing data had omissions for two or fewer items on only one scale, therefore data for these two were retained and missing data imputed using mean substitution. Therefore, in total 137 datasets remained and were included in analyses.

A summary of participant characteristics is included in Table 1. The sample was predominantly female (89.1%) and white (97.8%). Of the 137 participants, 48.2% were employed full-time and 46.7% were single.

[TABLE 1 NEAR HERE]

Sixty-six participants (48.6%) currently identified with an eating disorder regardless of formal diagnosis of which 42.4% identified with anorexia nervosa, 12.1% with bulimia nervosa, 24.2% with binge eating disorder, 18.2% with atypical or other disordered eating, and 3% preferred not to say. A total of 58 participants (42.3%) of the 137 in total reported having received at least one formal eating disorder diagnosis in their lifetime. Forty-five (32.8%) had been diagnosed with anorexia nervosa (AN), 18 (13.1%) had been diagnosed with bulimia nervosa (BN), 3 (2.2%) had been diagnosed with binge eating disorder (BED), and 15 (10.9%) had been diagnosed with eating disorder not otherwise specified (EDNOS). Furthermore, of the original 58, 56.9% described their stage of recovery as ‘not in treatment – recovering/recovered’, 22.4% said they were receiving outpatient treatment, 3.4% stated they were receiving inpatient treatment, and 17.2% described their stage of recovery as ‘other’ which generally included descriptions of not being in treatment and still having an active eating disorder. Additionally, 25.8% said they had been hospitalised in the past in relation to their diagnosed eating disorder.

### ***T-tests, descriptive statistics, and correlations***

T-tests were performed to examine differences on all scales between participants scoring above and below the clinical cut-off score ( $\geq 4$ ) on the EDE-Q. Table 2 displays results. Those scoring above the cut-off scored significantly higher than those below the cut-off on all scales, except the FSCRS Reassured self scale where those scoring above the cut-off scored significantly lower than those below the cut-off.

[TABLE 2 NEAR HERE]

Descriptive statistics and zero order non-parametric correlations among variables are included in Table 3. Age negatively correlated with SCRS, FSCRS Inadequate self, FSCRS Hated self, FOCS to self, and FOCS from others and positively correlated with FSCRS Reassured self.

The relationships between all measurement scales were significant at the  $p=0.01$  level and were rated moderate ( $r \geq .4$ ) or strong ( $r \geq .7$ ) with the exception of the correlations between ‘FOCS towards others’ and all other scales which were weaker yet significant. All scales positively correlated except for those between the ‘FSCRS Reassured self’ scale and all other scales which negatively correlated.

[TABLE 3 NEAR HERE]

### ***Mediation analyses***

Three separate mediation models (see Figure 2) were used to examine the indirect effect of self-critical rumination on disordered eating through fear of compassion to self (Model 1), from others (Model 2), and to others (Model 3).

[FIGURE 2 NEAR HERE]

The indirect effect was deemed significant if the 95% bias-corrected and accelerated (BCa) confidence interval did not contain zero (Hayes, 2018) with a full summary of results being contained within Table 4. Completely standardised indirect effect sizes are denoted by ‘ $ab_{cs}$ ’ and reported in-text to allow comparison between models (Preacher and Kelley, 2011).

[TABLE 4 NEAR HERE]

In Model 1 there was a significant indirect effect of self-critical rumination on disordered eating through fear of compassion *to self* ( $ab=.547$ ,  $BCa=.212-.900$ ;  $ab_{cs}=.237$ , 95%  $BCa\ CI=.095-.387$ ) and the direct path remained significant. In Model 2, there was a significant indirect effect through fear of compassion *from others* ( $ab=.423$ ,  $BCa=.190-.662$ ;  $ab_{cs}=.184$ , 95%  $BCa\ CI=.082-.284$ ) and the direct path remained significant. In Model 3 there was no indirect effect of self-critical rumination on disordered eating through fear of compassion *to others* ( $ab=.083$ ,  $BCa=-.001-.191$ ;  $ab_{cs}=.036$ , 95%  $BCa\ CI=-.001-.081$ ).

Six further mediation models (see Figure 3) were used to examine the indirect effect of the inadequate self subscale of the FSCRS on disordered eating through fear of compassion to self (Model 4), from others (Model 5), and to others (Model 6), and the indirect effect of the hated self subscale of the FSCRS on disordered eating through fear of compassion to self (Model 7), from others (Model 8), and to others (Model 9).

[FIGURE 3 NEAR HERE]

In Models 4 and 5, there was a significant indirect effect of self-criticism inadequate self on disordered eating through fear of compassion *to self* ( $ab=.036$ ,  $BCa=.004-.067$ ;  $ab_{cs}=.192$ , 95%  $BCa\ CI=.019-.359$ ) and through fear of compassion *from others* ( $ab=.030$ ,  $BCa=.009-.053$ ;  $ab_{cs}=.161$ , 95%  $BCa\ CI=.046-.278$ ). In Model 6, there was no indirect effect of self-criticism inadequate self on disordered eating through fear of compassion *to others* ( $ab=.006$ ,  $BCa=-.002-.015$ ;  $ab_{cs}=.030$ , 95%  $BCa\ CI=-.012-.079$ ).

In Models 7, 8, and 9 there was no indirect effect of self-criticism hated self on disordered eating through fear of compassion *to self* ( $ab=.047$ , 95%  $BCa=-.001-.100$ ;  $ab_{cs}=.173$ , 95%  $BCa\ CI=-.005-.365$ ), *from others* ( $ab=.037$ , 95%  $BCa=-.004-.080$ ;  $ab_{cs}=.137$ , 95%  $BCa\ CI=-.014-.288$ ), or *to others* ( $ab=.009$ , 95%  $BCa=-.001-.022$ ;  $ab_{cs}=.033$ , 95%  $BCa\ CI=-.003-.079$ ).

The first hypothesis was partially supported as an indirect effect of self-criticism (as a ruminative thinking style and in relation to a sense of personal inadequacy) on disordered eating behaviour through fear of compassion *to self* and fear of compassion *from others* was observed. However, unexpectedly, a similar indirect effect of self-criticism as a form of self-hatred on disordered eating behaviour through fear of compassion *to self* and fear of compassion *from others* was not observed. The second hypothesis that no indirect effect of self-criticism of any type would be observed on disordered eating behaviour through fear of compassion *to others* was supported.

## **Discussion**

Self-criticism has been linked to a range of psychological difficulties including disordered eating (Duarte, Ferreira, & Pinto-Gouveia, 2016; Fennig et al., 2008; Thew, Gregory, Roberts, & Rimes, 2017) wherein higher levels of self-criticism are shown to be associated with greater symptom severity in eating disorders (Dunkley, Stanislow, Grilo, & McGlashan, 2009; Fennig et al., 2008; Porter, Zelkowitz, & Cole, 2018). Ability to receive compassion has demonstrated a buffering effect on the impact of self-criticism on disordered eating (Hermanto et al., 2016) and, as such, research has focused on the development of compassion-focused psychological interventions as a way of helping those who experience disordered eating behaviours including clinically diagnosed eating disorders. Fear of compassion is recognised as a key factor given that a primary aim is to help individuals to increase compassion towards themselves and feel more able to receive and accept compassion from others. However, the indirect effect of self-criticism on disordered eating through the different types of fear of compassion had not been examined using robust mediational models.

The present study therefore sought to test a theoretical model that self-criticism contributes to disordered eating behaviour indirectly through fear of compassion. There is a

potential theoretical distinction between fear of receiving compassion, either externally from others or internally i.e. showing compassion to oneself, versus fear of showing compassion towards others. Therefore, hypotheses for the current study were that there would be an indirect relationship between self-criticism and disordered eating behaviour through the two types of receiving compassion but not through showing compassion to others. This effect was expected for all three forms of self-criticism measured, which were self-criticism: as a ruminative thinking style; in relation to a sense of personal inadequacy; and, as a form of self-hatred.

The EDE-Q is widely used in both clinical and research contexts as a screening tool to identify cases that might warrant further specialist assessment for eating disorders. In the present study, individuals scoring above the clinical cut-off scored higher than those below on all measures of self-criticism and fear of compassion and scored lower on ability to reassure themselves in the face of criticism. These findings fit with previous research wherein self-criticism has been shown over and over again to be strongly associated with the development and maintenance of eating disorders (Duarte, Ferreira, & Pinto-Gouveia, 2016; Dunkley & Grilo, 2007; Fennig et al., 2008; Noordenbos, Aliakbari, & Campbell, 2014; Thew, Gregory, Roberts, & Rimes, 2017).

Mediation analyses partially supported the initial study hypotheses through demonstrating an indirect effect of two forms of self-criticism, namely those related to self-critical rumination and a sense of personal inadequacy, on disordered eating behaviour through fear of compassion.

Self-critical rumination and self-criticism in relation to feelings of inadequacy were both associated with disordered eating behaviours through fear of compassion. As anticipated, these relationships were mediated by fear of *receiving* compassion, either internally from the self or externally from others, and not by fear of the outward expression of compassion towards



others. Unexpectedly, however, none of the models including the form of self-criticism related to self-hatred demonstrated an indirect effect through any of the three flows of fear of compassion.

Evidence was found for an indirect effect of increased self-critical rumination on more severe disordered eating behaviour through higher levels of fear of compassion to self and from others. The same effect was not observed when fear of compassion to others was entered as a mediator. Associations identified in the present study between self-critical rumination and disordered eating behaviour are consistent with prior research. Rumination focused on self-critical thoughts has been linked to lower levels of self-compassion and difficulties in emotional regulation (Moreira & Maia, 2018) which are considered to play a role in the development and maintenance of eating disorders (Brockmeyer et al., 2014; Harrison, Sullivan, Tchanturia, & Treasure, 2010; Kelly & Tasca, 2016; Svaldi, Griepenstroh, Tuschen-Caffiera, & Ehring, 2012). That this pre-existing relationship has been shown in the present study to be mediated by fear of receiving compassion from self or others, but not showing compassion to others, reveals a potential underlying mechanism wherein self-criticism has a direct effect on fear of receiving compassion and, in turn, influences disordered eating behaviours. It may be that being prone to habitual, prolonged, and repetitive self-critical thinking style leaves little room for compassion creating a sense that it is undeserved and therefore experienced as illegitimate. In the context of disordered eating behaviours, the content of self-critical rumination can include thoughts related to shape, weight, or eating (Tierney & Fox, 2010). The offer of care or support from others, including as part of a therapeutic relationship, could trigger fear of compassion and related anxiety about breaking rules or lowering standards. It could potentially follow that disordered eating behaviours are enacted as a way of down-regulating the threat system and overcoming negative mood states related to both self-criticism and fear of compassion. Furthermore, beliefs may be held about the intended self-improving function

of self-criticism (Gilbert, Durrant, & McEwan, 2006). Paradoxically this might lead to the emergence of disordered eating behaviours as a way of coping with negative emotional states resulting from self-criticism and fear of compassion.

Results revealed the same pattern as above for self-criticism as a sense of personal inadequacy. Similarly, an indirect effect of higher levels of this form of self-criticism on more severe disordered eating behaviour through increased fear of compassion to self and from others was observed. This is congruent with previous findings that fear of compassion to self and from others had moderate to high positive correlations with self-criticism in the form of inadequacy of the self (Gilbert, 2014).

Support was not obtained for self-criticism as a form of self-hatred having an indirect effect of disordered eating behaviour through any of the three flows of compassion, however results were close to achieving significance. Indeed the average level of self-criticism as a form of self-hatred was similar to that linked to feelings of inadequacy. Plus, significant positive associations were found between self-criticism as a form of self-hatred and all three flows of compassion which is in line with Gilbert et al.'s (2011) findings using a general population. It is possible therefore that the relationship between this potentially more harmful form of self-criticism, linked with self-hatred and a desire to want to harm or punish the self, and disordered eating is mediated by other factors not measured in the current study. For example, binge eating in particular has been associated with this type of self-criticism along with depression and body image shame (Duarte, Pinto-Gouveia, & Ferreira, 2014). Indeed, it has been suggested that shame also plays a role in maintaining activation of threat systems and is associated with high levels of self-criticism (Harman & Lee, 2010). Furthermore, self-criticism linked with self-hatred and a desire to want to harm or punish the self has been linked with shame memories central to sense of self-identity (Pinto-Gouveia, Castilho, Matos & Xavier, 2013) and self-harming behaviours (Xavier, Pinto-Gouveia, & Cunha, 2016).

Given that models including self-criticism as a form of self-hatred came close to significance, more research exploring the mechanism between this concept and disordered eating would be advantageous. This could perhaps include an exploration of relationships with shame, depression, and self-harm.

Extreme, negative self-to-self relating such as self-hatred, is relevant to disordered eating populations who typically have experience of high levels of trauma (Brewerton, 2007; Corstorphine, Waller, Lawson, & Ganis, 2007). Such traumatic experiences may contribute to early maladaptive schemas and self-perception as fundamentally unacceptable or bad which could provide some understanding of why models in the current study including self-criticism as a form of self-hatred came close to significance. This may include individuals who also attract diagnoses linked with personality difficulties (Barazandeh, Kissane, Saeedi, & Gordon, 2016) and there is some overlap between such difficulties and eating disorders in clinical populations (Becker & Grilo, 2015; Herzog, Keller, Lavori, Kenny, & Sacks, 1992; Martinussen et al., 2017; Zinarini, Reichman, Frankenburg, Reich, & Fitzmaurice, 2010),

### ***Strengths and limitations***

The cross-sectional online survey methodology used in the current study provided clear benefits such as economical advantage, minimisation of missing data, ease of access for participants, speed of recruitment, and ability to achieve higher recruitment rates and a geographically more representative participant sample. However, there are also several inherent drawbacks. Although theoretically it should have been possible to achieve a more nationally representative and inclusive sample through use of online social networking sites, the majority of participants were female and White British. Additionally, online recruitment may have excluded people who were unable to access or use computer technology. Moreover, although validated self-report measures were employed in the current study which are

vulnerable to responder biases, anonymised online survey methodology was purposely chosen in an attempt to counteract this effect.

By its very nature, cross-sectional research limits inferences regarding causality, therefore at present the directionality of the relationship between self-criticism and fear of compassion remains unclear and warrants further exploration within future longitudinal studies. The current study used several mediation models yielding estimates of each individual X's direct and indirect effects on Y. Alternative types of mediation analysis, such as parallel or serial mediation, or entering several Xs into one model, could have been considered in order to allow all variables to be entered into one potentially more parsimonious model. Such alternatives may have adjusted for overlap between mediators, offered estimates of parts of one X's effect on Y, both directly and indirectly, or allowed the model to control for the influence of other variables. Whilst these may be of interest for future research, the current approach (i.e. multiple single X mediation models) avoided the well-documented concern regarding the risk of multiple highly correlated Xs cancelling out one another's effects (Hayes, 2018). In addition, the inclusion of theoretically related mediators, such as the three subscales of the fear of compassion scale as per the current study, within a single model is contraindicated (Kane & Ashbaugh, 2017).

A common misconception that eating disorders occur primarily among females has resulted in a systematic underrepresentation of males in eating disorder research, hindering understanding and management of eating disorders, and ultimately service access, in males (Murray et al., 2017). In the current study, males represented just 9.5% of the sample which is less than recent point prevalence estimates of eating disorders in males of between 25% and 33% (Sweeting et al., 2015). Not only does this affect generalisability of results across genders but also creates a missed opportunity to promote the voice of males in eating disorder research

and potentially add to our understanding of some of the processes underlying eating disorders in both males and females.

Finally, known differences in eating disorder presentations between males and females also pose an issue within eating disorder research studies, particularly those relying on diagnostic interviews linked to current classification systems that fail to recognise or account for such gender differences. The current study may have been partially buffered from this effect due to having employed a scale measure of eating disorders rather than recording formal diagnosis. Although the EDE-Q does pertain to key features of diagnostic criteria, it is possible that it allows more opportunity for ‘typically’ male- or muscularity-orientated eating disorder presentations to be reflected.

### ***Clinical implications***

Of particular relevance to clinical practice is the need for therapists to carefully assess not only levels of self-criticism but also fears of compassion in their clients. This could be done by asking clients to complete the fears of compassion scale, in addition to measure of self-criticism, during assessment. The experience of a compassionate stance from the therapist or encouragement to develop self-compassion as a therapeutic goal could constitute barriers to therapeutic progress or contribute to disengagement for those in which compassion triggers a threat-based response. Compassion-focused therapy for eating disorders includes a module specifically related to blocks to compassion therefore other psychological approaches might also benefit from acknowledging this in their protocols.

### ***Conclusions***

The findings of the current study elucidate processes related to fear of receiving compassion, either internally from the self or externally from others, as potentially key mechanisms

underpinning the relationship between self-criticism and disordered eating behaviours. That is, the relationships between self-criticism in two forms, namely self-critical rumination and self-criticism as a sense of personal inadequacy, and disordered eating were mediated by fear of showing compassion to oneself and receiving compassion from others. These results highlight a unique path to disordered eating among people who criticise themselves, either as part of a ruminative thinking style in which they become stuck, or because of a focus on what they feel are personal inadequacies. This is related to becoming fearful of showing compassion to themselves or receiving it from others perhaps because they believe they are inadequate and undeserving of compassion and little cognitive space remains to consider other more compassionate viewpoints. Finally, given the act of feeding oneself is congruent on the most basic level with fundamental principles of compassion, a sensitivity to suffering (hunger) and a commitment to alleviate it (feed oneself), the theoretical relationship between fear of compassion and disordered eating makes sense. Furthermore, if people who experience high levels of self-criticism are more prone to disordered eating and also experience a fear of compassion, then they might consider themselves undeserving of food and experience the process of feeding oneself as fearful or threatening, thus leading to restricting diet or purging. It would therefore be interesting for future researchers to further break down the relationships between self-criticism, the different types of fear of compassion, and specific aspects of disordered eating such as binge eating, restricting, and purging. Additionally, it could be worthwhile to examine the interplay between the different types of self-criticism with the specific items on fears of compassion scales on an item level.

## References

- Baiao, R., Gilbert, P., McEwan, K., & Carvalho, S. (2015). Forms of Self-Criticising/Attacking & Self-Reassuring Scale: Psychometric properties and normative study. *Psychol Psychother*, *88*(4), 438-452. doi:10.1111/papt.12049
- Barazandeh, H., Kissane, D. W., Saeedi, N., & Gordon, M. (2016). A systematic review of the relationship between early maladaptive schemas and borderline personality disorder/traits. *Personality and Individual Differences*, *94*, 130-139.
- Batson, C. D., Klein, T. R., Highberger, L., & Shaw, L. L. (1995). Immorality from empathy-induced altruism: When compassion and justice conflict. *Journal of Personality and Social Psychology*, *68*(6), 1042.
- Beck, A. T. (1979). *Cognitive therapy of depression*: Guilford press.
- Becker, D. F., & Grilo, C. M. (2015). Comorbidity of mood and substance use disorders in patients with binge-eating disorder: Associations with personality disorder and eating disorder pathology. *Journal of psychosomatic research*, *79*(2), 159-164. doi:10.1016/j.jpsychores.2015.01.016
- Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2012). Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: a systematic review of the literature. *The International journal of eating disorders*, *45*(3), 428-438. doi:10.1002/eat.20931
- Berndsen, M., & Feather, N. T. (2016). Reflecting on schadenfreude: serious consequences of a misfortune for which one is not responsible diminish previously expressed schadenfreude; the role of immorality appraisals and moral emotions. *Motivation and Emotion*, *40*(6), 895-913. doi:10.1007/s11031-016-9580-8
- Brewerton, T. D. (2007). Eating disorders, trauma, and comorbidity: Focus on PTSD. *Eating Disorders*, *15*(4), 285-304.

- Brockmeyer, T., Skunde, M., Wu, M., Bresslein, E., Rudofsky, G., Herzog, W., & Friederich, H.-C. (2014). Difficulties in emotion regulation across the spectrum of eating disorders. *Comprehensive Psychiatry*, *55*(3), 565-571.  
doi:<https://doi.org/10.1016/j.comppsy.2013.12.001>
- Carvalho, C. B., Sousa, M., da Motta, C., & Cabral, J. M. (2019). The Role of Shame, Self-criticism and Early Emotional Memories in Adolescents' Paranoid Ideation. *Journal of Child and Family Studies*, *28*(5), 1337-1345. doi:10.1007/s10826-019-01363-2
- Caslini, M., Bartoli, F., Crocamo, C., Dakanalis, A., Clerici, M., & Carrà, G. (2016). Disentangling the Association Between Child Abuse and Eating Disorders: A Systematic Review and Meta-Analysis. *Psychosomatic Medicine*, *78*(1), 79-90.  
doi:10.1097/psy.0000000000000233
- Cooper, Z., & Grave, R. D. (2017). Chapter 14 - Eating Disorders: Transdiagnostic Theory and Treatment. In S. G. Hofmann & G. J. G. Asmundson (Eds.), *The Science of Cognitive Behavioral Therapy* (pp. 337-357). San Diego: Academic Press.
- Corstorphine, E., Waller, G., Lawson, R., & Ganis, C. (2007). Trauma and multi-impulsivity in the eating disorders. *Eat Behav*, *8*(1), 23-30.  
doi:<https://doi.org/10.1016/j.eatbeh.2004.08.009>
- Dinger, U., Barrett, M. S., Zimmermann, J., Schauenburg, H., Wright, A. G., Renner, F., . . . Barber, J. P. (2015). Interpersonal problems, dependency, and self-criticism in major depressive disorder. *Journal of Clinical Psychology*, *71*(1), 93-104.
- Duarte, C., Ferreira, C., & Pinto-Gouveia, J. (2016). At the core of eating disorders: Overvaluation, social rank, self-criticism and shame in anorexia, bulimia and binge eating disorder. *Comprehensive Psychiatry*, *66*, 123-131.  
doi:<https://doi.org/10.1016/j.comppsy.2016.01.003>



- Duarte, C., Pinto-Gouveia, J., & Ferreira, C. (2014). Escaping from body image shame and harsh self-criticism: Exploration of underlying mechanisms of binge eating. *Eat Behav*, *15*(4), 638-643. doi:<https://doi.org/10.1016/j.eatbeh.2014.08.025>
- Dunkley, D. M., & Grilo, C. M. (2007). Self-criticism, low self-esteem, depressive symptoms, and over-evaluation of shape and weight in binge eating disorder patients. *Behav Res Ther*, *45*(1), 139-149. doi:<https://doi.org/10.1016/j.brat.2006.01.017>
- Dunkley, D. M., Sanislow, C. A., Grilo, C. M., & McGlashan, T. H. (2009). Self-criticism versus neuroticism in predicting depression and psychosocial impairment for 4 years in a clinical sample. *Compr Psychiatry*, *50*(4), 335-346. doi:[10.1016/j.comppsy.2008.09.004](https://doi.org/10.1016/j.comppsy.2008.09.004)
- Ehret, A. M., Joormann, J., & Berking, M. (2015). Examining risk and resilience factors for depression: The role of self-criticism and self-compassion. *Cognition and Emotion*, *29*(8), 1496-1504. doi:[10.1080/02699931.2014.992394](https://doi.org/10.1080/02699931.2014.992394)
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders*, *16*(4), 363-370.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: a "transdiagnostic" theory and treatment. *Behav Res Ther*, *41*(5), 509-528.
- Feeney, B. C., & Collins, N. L. (2001). Predictors of caregiving in adult intimate relationships: An attachment theoretical perspective. *Journal of Personality and Social Psychology*, *80*(6), 972.
- Fennig, S., Hadas, A., Itzhaky, L., Roe, D., Apter, A., & Shahar, G. (2008). Self-criticism is a key predictor of eating disorder dimensions among inpatient adolescent females. *International Journal of Eating Disorders*, *41*(8), 762-765. doi:[10.1002/eat.20573](https://doi.org/10.1002/eat.20573)
- Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics*. In: London: SAGE PUBLN.

- Fritz, M. S., & Mackinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychol Sci, 18*(3), 233-239. doi:10.1111/j.1467-9280.2007.01882.x
- Gale, C., Gilbert, P., Read, N., & Goss, K. (2014). An evaluation of the impact of introducing compassion focused therapy to a standard treatment programme for people with eating disorders. *Clinical Psychology & Psychotherapy, 21*(1), 1-12.
- Gilbert, P. (2009). Introducing compassion-focused therapy. *Advances in psychiatric treatment, 15*(3), 199-208.
- Gilbert, P., Clarke, M., Hempel, S., Miles, J. N. V., & Irons, C. (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *43*(1), 31-50. doi:10.1348/014466504772812959
- Gilbert, P., Durrant, R., & McEwan, K. (2006). Investigating relationships between perfectionism, forms and functions of self-criticism, and sensitivity to put-down. *Personality and Individual Differences, 41*(7), 1299-1308.
- Gilbert, P., McEwan, K., Catarino, F., & Baião, R. (2014). Fears of compassion in a depressed population implication for psychotherapy. *Journal of Depression and Anxiety*.
- Gilbert, P., McEwan, K., Matos, M., & Ravis, A. (2011). Fears of compassion: development of three self-report measures. *Psychol Psychother, 84*(3), 239-255.  
doi:10.1348/147608310x526511
- Gilbert, P., & Miles, J. N. (2000). Sensitivity to Social Put-Down: it's relationship to perceptions of social rank, shame, social anxiety, depression, anger and self-other blame. *Personality and Individual Differences, 29*(4), 757-774.
- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy, 13*(6), 353-379. doi:10.1002/cpp.507

- Goss, K., & Allan, S. (2014). The development and application of compassion-focused therapy for eating disorders (CFT-E). *53*(1), 62-77. doi:10.1111/bjc.12039
- Harman, R., & Lee, D. (2010). The role of shame and self-critical thinking in the development and maintenance of current threat in post-traumatic stress disorder. *Clinical Psychology & Psychotherapy, 17*(1), 13-24. doi:10.1002/cpp.636
- Harrison, A., Sullivan, S., Tchanturia, K., & Treasure, J. (2010). Emotional functioning in eating disorders: attentional bias, emotion recognition and emotion regulation. *Psychological Medicine, 40*(11), 1887-1897. doi:10.1017/S0033291710000036
- Hayes, A.F. (2018). *Introduction to mediation, moderation and conditional process analysis: a regression-based approach* (2nd ed.). New York, NY, US: Guilford Press.
- Hermanto, N., Zuroff, D. C., Kopala-Sibley, D. C., Kelly, A. C., Matos, M., Gilbert, P., & Koestner, R. (2016). Ability to receive compassion from others buffers the depressogenic effect of self-criticism: A cross-cultural multi-study analysis. *Personality and Individual Differences, 98*, 324-332.
- Herzog, D. B., Keller, M. B., Lavori, P. W., Kenny, G. M., & Sacks, N. R. (1992). The prevalence of personality disorders in 210 women with eating disorders. *The Journal of Clinical Psychiatry, 53*(5), 147-152.
- Iancu, I., Bodner, E., & Ben-Zion, I. Z. (2015). Self esteem, dependency, self-efficacy and self-criticism in social anxiety disorder. *Comprehensive Psychiatry, 58*, 165-171. doi:<https://doi.org/10.1016/j.comppsy.2014.11.018>
- IBM. (2017). IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.
- Jazaieri, H., Thupten Jinpa, G., McGonigal, K., Rosenberg, E.L., Finkelstein, J., Simon-Thomas, E., Cullen, M., Doty, J.R., Gross, J.J., & Goldin, P.R. (2013). Enhancing Compassion: A Randomized Controlled Trial of a Compassion Cultivation Training

- Program. *Journal of Happiness Studies*, 14, 1113-1126. Doi:10.1007/s10902-012-9373-z
- Joeng, J. R., & Turner, S. L. (2015). Mediators between self-criticism and depression: Fear of compassion, self-compassion, and importance to others. *Journal of Counseling Psychology*, 62(3), 453-463. doi:10.1037/cou0000071
- Kane, L., & Ashbaugh, A. R. (2017). Simple and parallel mediation: A tutorial exploring anxiety sensitivity, sensation seeking, and gender. *The Quantitative Methods for Psychology*, 12(4), 148-165.
- Kannan, D., & Levitt, H. M. (2017). Self-criticism in therapist training: A grounded theory analysis. *Psychotherapy Research*, 27(2), 201-214.
- Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of self-compassion interact to predict response to eating disorders treatment: A preliminary investigation. *Psychotherapy Research*, 23(3), 252-264.  
doi:10.1080/10503307.2012.717310
- Kelly, A. C., & Tasca, G. A. (2016). Within-persons predictors of change during eating disorders treatment: An examination of self-compassion, self-criticism, shame, and eating disorder symptoms. *International Journal of Eating Disorders*, 49(7), 716-722.  
doi:10.1002/eat.22527
- Kelly, A. C., Vimalakanthan, K., & Carter, J. C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: An examination of female students and eating disorder patients. *Eat Behav*, 15(3), 388-391. doi:https://doi.org/10.1016/j.eatbeh.2014.04.008
- Kopala-Sibley, D. C., Zuroff, D. C., Hankin, B. L., & Abela, J. R. Z. (2015). The Development of Self-Criticism and Dependency in Early Adolescence and Their Role

- in the Development of Depressive and Anxiety Symptoms. *Personality and Social Psychology Bulletin*, 41(8), 1094-1109. doi:10.1177/0146167215590985
- Marshall, M. B., Zuroff, D. C., McBride, C., & Bagby, R. M. (2008). Self-criticism predicts differential response to treatment for major depression. *Journal of Clinical Psychology*, 64(3), 231-244. doi:10.1002/jclp.20438
- Martinussen, M., Friberg, O., Schmierer, P., Kaiser, S., Øvergård, K. T., Neunhoeffler, A.-L., . . . Rosenvinge, J. H. (2017). The comorbidity of personality disorders in eating disorders: a meta-analysis. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 22(2), 201-209. doi:10.1007/s40519-016-0345-x
- Mikulincer, M., Shaver, P. R., Gillath, O., & Nitzberg, R. A. (2005). Attachment, Caregiving, and Altruism: Boosting Attachment Security Increases Compassion and Helping. *Journal of Personality and Social Psychology*, 89(5), 817-839. doi:10.1037/0022-3514.89.5.817
- Moreira, H., & Maia, B. R. (2018). Self-critical rumination as a mediator between attachment orientations and perceived stress: Evidence from a cross-cultural validation of the self-critical rumination scale. *Current Psychology*. doi:10.1007/s12144-018-0025-2
- Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., . . . Mond, J. M. (2017). The enigma of male eating disorders: A critical review and synthesis. *Clin Psychol Rev*, 57, 1-11. doi:https://doi.org/10.1016/j.cpr.2017.08.001
- Noordenbos, G., Aliakbari, N., & Campbell, R. (2014). The Relationship Among Critical Inner Voices, Low Self-Esteem, and Self-Criticism in Eating Disorders. *Eating Disorders*, 22(4), 337-351. doi:10.1080/10640266.2014.898983
- Oliveira, V. R., Ferreira, C., Mendes, A. L., & Marta-Simões, J. (2017). Shame and eating psychopathology in Portuguese women: Exploring the roles of self-judgment and

fears of receiving compassion. *Appetite*, *110*, 80-85.

doi:<https://doi.org/10.1016/j.appet.2016.12.012>

- Pinto-Gouveia, J., Castilho, P., Matos, M., & Xavier, A. (2013). Centrality of shame memories and psychopathology: The mediator effect of self-criticism. *Clinical Psychology: Science and Practice*, *20*(3), 323-334.
- Porter, A. C., Zelkowitz, R. L., & Cole, D. A. (2018). The unique associations of self-criticism and shame-proneness to symptoms of disordered eating and depression. *Eat Behav*, *29*, 64-67. doi:[10.1016/j.eatbeh.2018.02.008](https://doi.org/10.1016/j.eatbeh.2018.02.008)
- Preacher, K.J., & Kelly, K. (2011). Effect size measures for mediation models: quantitative strategies for communicating indirect effects. *Psychological Methods*, *16*(2), 93-115. doi:[10.1037/a0022658](https://doi.org/10.1037/a0022658).
- Rector, N. A., Bagby, R. M., Segal, Z. V., Joffe, R. T., & Levitt, A. (2000). Self-Criticism and Dependency in Depressed Patients Treated with Cognitive Therapy or Pharmacotherapy. *Cognitive Therapy and Research*, *24*(5), 571-584. doi:[10.1023/a:1005566112869](https://doi.org/10.1023/a:1005566112869)
- Rockliff, H., Gilbert, P., McEwan, K., Lightman, S., & Glover, D. (2008). A pilot exploration of heart rate variability and salivary cortisol responses to compassion-focused imagery. *Clinical Neuropsychiatry: Journal of Treatment Evaluation*, *5*(3), 132-139.
- Rose, A. V., & Rimes, K. A. (2018). Self-criticism self-report measures: Systematic review. *Psychol Psychother*, *91*(4), 450-489. doi:[10.1111/papt.12171](https://doi.org/10.1111/papt.12171)
- Rose, J. S., Vaewsorn, A., Rosselli-Navarra, F., Wilson, G. T., & Weissman, R. S. (2013). Test-retest reliability of the eating disorder examination-questionnaire (EDE-Q) in a college sample. *Journal of eating disorders*, *1*, 42-42. doi:[10.1186/2050-2974-1-42](https://doi.org/10.1186/2050-2974-1-42)

- Shahar, B., Doron, G., & Szepeswol, O. (2015). Childhood Maltreatment, Shame-Proneness and Self-Criticism in Social Anxiety Disorder: A Sequential Mediation Model. *Clinical Psychology & Psychotherapy*, 22(6), 570-579. doi:10.1002/cpp.1918
- Smart, L. M., Peters, J. R., & Baer, R. A. (2016). Development and Validation of a Measure of Self-Critical Rumination. *Assessment*, 23(3), 321-332. doi:10.1177/1073191115573300
- Svaldi, J., Griepenstroh, J., Tuschen-Caffier, B., & Ehring, T. (2012). Emotion regulation deficits in eating disorders: A marker of eating pathology or general psychopathology? *Psychiatry Research*, 197(1), 103-111. doi:https://doi.org/10.1016/j.psychres.2011.11.009
- Sweeting, H., Walker, L., MacLean, A., Patterson, C., Räisänen, U., & Hunt, K. (2015). Prevalence of eating disorders in males: a review of rates reported in academic research and UK mass media. *International journal of men's health*, 14(2).
- Thew, G. R., Gregory, J. D., Roberts, K., & Rimes, K. A. (2017). The phenomenology of self-critical thinking in people with depression, eating disorders, and in healthy individuals. *Psychology and Psychotherapy: Theory, Research and Practice*, 90(4), 751-769. doi:10.1111/papt.12137
- Thompson-Brenner, H., Boswell, J. F., Espel-Huynh, H., Brooks, G., & Lowe, M. R. (2018). Implementation of transdiagnostic treatment for emotional disorders in residential eating disorder programs: A preliminary pre-post evaluation. *Psychotherapy Research*, 1-17. doi:10.1080/10503307.2018.1446563
- Whelton, W. J., & Greenberg, L. S. (2005). Emotion in self-criticism. *Personality and Individual Differences*, 38(7), 1583-1595. doi:10.1016/j.paid.2004.09.024
- Whelton, W. J., & Henkelman, J. J. (2002). A verbal analysis of forms of self-criticism. *Alberta Journal of Educational Research*, 48(1), 88-90.

Xavier, A., Pinto Gouveia, J., & Cunha, M. (2016). Non-suicidal Self-Injury in Adolescence: The Role of Shame, Self-Criticism and Fear of Self-Compassion. *Child & Youth Care Forum*, 45(4), 571-586. doi:10.1007/s10566-016-9346-1

Zanarini, M. C., Reichman, C. A., Frankenburg, F. R., Reich, D. B., & Fitzmaurice, G. (2010). The course of eating disorders in patients with borderline personality disorder: a 10-year follow-up study. *The International journal of eating disorders*, 43(3), 226-232. doi:10.1002/eat.20689



Table 1. Participant characteristics (N = 137)

		<b>Mean</b>	<b>SD</b>
Age		31.65	10.57
		<b>N</b>	<b>%</b>
Gender	Female	122	89.1
	Male	10	7.3
	Transgender male	3	2.2
	Other	2	1.5
Ethnicity	White	134	97.8
	Indian	1	0.7
	Arab	1	0.7
	Prefer not to say	1	0.7
Occupational status	Employed full-time	66	48.2
	Employed part-time	16	11.7
	Not currently working	13	9.5
	Student	31	22.6
	Self-employed	2	1.5
	Retired	3	2.2
	Caring for children/others	3	2.2
	Other	3	2.2
Partnership status	Single	64	46.7
	Married	36	26.3
	Living together but not married	29	21.2
	Civil partnership	1	0.7
	Divorced	2	1.5
	Widowed	2	1.5
	Prefer not to say	3	2.2
		<b>Mean</b>	<b>SD</b>
DASS depression subscale score (range 0-42)		18.12	12.38
		<b>N</b>	<b>%</b>
Depression subscale	Normal	42	30.7
	Mild	16	11.7
	Moderate	24	17.5
	Severe	23	16.8
	Extremely severe	32	23.4

Notes: DASS, 'Depression, Anxiety and Stress Scale' (Lovibond & Lovibond, 1986)

Table 2. *T*-tests for differences between participants scoring above and above the EDE-Q cut-off

	EDE-Q Global score above clinical cut-off		EDE-Q Global score below clinical cut-off		<i>t</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
SCRS <sup>^</sup>	3.68	0.34	2.90	0.75	8.19**	120
FOCS to self	37.39	12.57	20.99	13.72	7.12**	135
FOCS from others	32.32	11.12	17.63	10.68	7.78**	135
FOCS to others	16.13	7.75	12.70	7.27	2.64**	135
FSCRS Inadequate self <sup>^</sup>	31.54	3.53	21.74	9.16	8.73**	111
FSCRS Hated self	14.77	4.17	6.77	4.96	9.89**	135
FSCRS Reassured self <sup>^</sup>	6.93	5.04	14.22	6.50	-7.39**	133

Notes: EDE-Q, Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994); FOCS, Fears of Compassion Scale (Gilbert, McEwan, Matos, & Ravis, 2011); FSCRS, Forms of Self-Criticising and Self-Reassuring Scale (Gilbert, Clarke, Hempel, Miles, & Irons, 2004); SCRS, Self-Critical Rumination Scale (Smart, Peters, & Baer, 2015).

<sup>^</sup> Levene's test for homogeneity of variance was significant therefore results of Welch's *t*-test is reported

\**p*<0.05

\*\**p*<0.01

Table 3. Means, standard deviations, ranges, and non-parametric bivariate correlations among variables

Indicator	1	2	3	4	5	6	7	8	9	110	11	12	13
1. Age	1	-.184**	-.253*	-.178*	.240**	-.215*	-.184*	-.062	-.013	-.146	-.126	-.085	-.105
2. SCRS		1	.842**	.771**	-.721**	.710**	.587**	.227**	.414**	.602**	.628**	.590**	.599**
3. FSCRS Inadequate self			1	.825**	-.776**	.782**	.661**	.303**	.457**	.649**	.673**	.634**	.650**
4. FSCRS Hated self				1	-.773**	.799**	.724**	.263**	.507**	.671**	.690**	.648**	.682**
5. FSCRS Reassured self					1	-.715**	-.632**	-.222**	-.488**	-.624**	-.643**	-.596**	-.636**
6. FOCS to self						1	.830**	.376**	.501**	.601**	.616**	.568**	.614**
7. FOCS from others							1	.430**	.480**	.575**	.593**	.531**	.586**
8. FOCS towards others								1	.230**	.284**	.318**	.266**	.284**
9. EDE-Q Restraint									1	.702**	.738**	.731**	.874**
10. EDE-Q Eating concern										1	.823**	.794**	.908**
11. EDE-Q Shape concern											1	.912**	.937**
12. EDE-Q Weight concern												1	.928**
13. EDE-Q Global													1
Mean	31.65	3.22	25.74	10.04	11.24	27.69	23.64	14.10	2.81	2.48	3.94	3.64	3.22
SD	10.57	0.72	8.82	6.09	6.93	15.50	13.03	7.63	1.92	1.81	1.77	1.82	1.67
Range	18-66	1.2-4	1-36	0-20	0-32	0-60	0-50	0-32	0-6	0-6	0-6	0-6	0-60

Notes: EDE-Q, Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994); FOCS, Fears of Compassion Scale (Gilbert, McEwan, Matos, & Ravis, 2011); FSCRS, Forms of Self-Criticising and Self-Reassuring Scale (Gilbert, Clarke, Hempel, Miles, & Irons, 2004); SCRS, Self-Critical Rumination Scale (Smart, Peters, & Baer, 2015).

\* $p < 0.05$   
\*\* $p < 0.01$

Table 4. Summary of mediation analyses of self-criticism on disordered eating through fear of compassion

Model (mediator)	IV	Effects of IV on M (path <i>a</i> )	Effects of M on DV (path <i>b</i> )	Direct effects (path <i>c</i> ')	Indirect effects (path <i>ab</i> )	Indirect effects (path <i>ab</i> ) BCa 95% CI <sup>1,2</sup>		Total effect (path <i>c</i> )	Completely standardised effect ( <i>c</i> '- <i>cs</i> )	Completely standardised effect BCa 95% CI <sup>1,2</sup>	
						Lower	Upper			Lower	Upper
Total											
Model 1 (FOCS to self)	SCRS	15.47***	0.04***	.92***	.547 <sup>^</sup>	0.212	0.900	1.47***	.237 <sup>^</sup>	.095	.387
Model 2 (FOCS from others)	SCRS	10.74***	0.04***	1.05***	.427 <sup>^</sup>	0.190	0.662	1.47***	.184 <sup>^</sup>	.082	.284
Model 3 (FOCS to others)	SCRS	2.67**	0.03**	1.39***	.083	-0.001	0.191	1.47***	.036	-.001	.081
Model 4 (FOCS to self)	FSCRS Inadequate self	1.34***	0.03*	0.09***	.036 <sup>^</sup>	0.004	0.067	0.13***	.192 <sup>^</sup>	.019	.359
Model 5 (FOCS from others)	FSCRS Inadequate self	0.96***	0.03*	0.10***	.030 <sup>^</sup>	0.009	0.053	0.13***	.161 <sup>^</sup>	.046	.278
Model 6 (FOCS to others)	FSCRS Inadequate self	.027***	0.02	0.12***	.006	-0.002	0.015	0.13***	.030	-.012	.079
Model 7 (FOCS to self)	FSCRS Hated self	2.02***	0.02*	0.14***	.047	-0.001	0.100	0.18***	.173	-.005	.365
Model 8 (FOCS from others)	FSCRS Hated self	1.54***	0.02*	0.15***	.037	-0.004	0.080	0.18***	.137	-.014	.288
Model 9 (FOCS to others)	FSCRS Hated self	0.34**	0.03	0.18***	.009	-0.001	0.022	0.18***	.033	-.003	.079

<sup>1</sup> Bias-corrected and accelerated bootstrap confidence interval; 5000 bootstrap samples, <sup>2</sup> Lower and upper BCa intervals containing zero indicate non-significant effect

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001

<sup>^</sup> Significant indirect effect – please note it is not possible to quote a probability level using this methodology (see Hayes, 2018)

Figure 1. Theoretical model

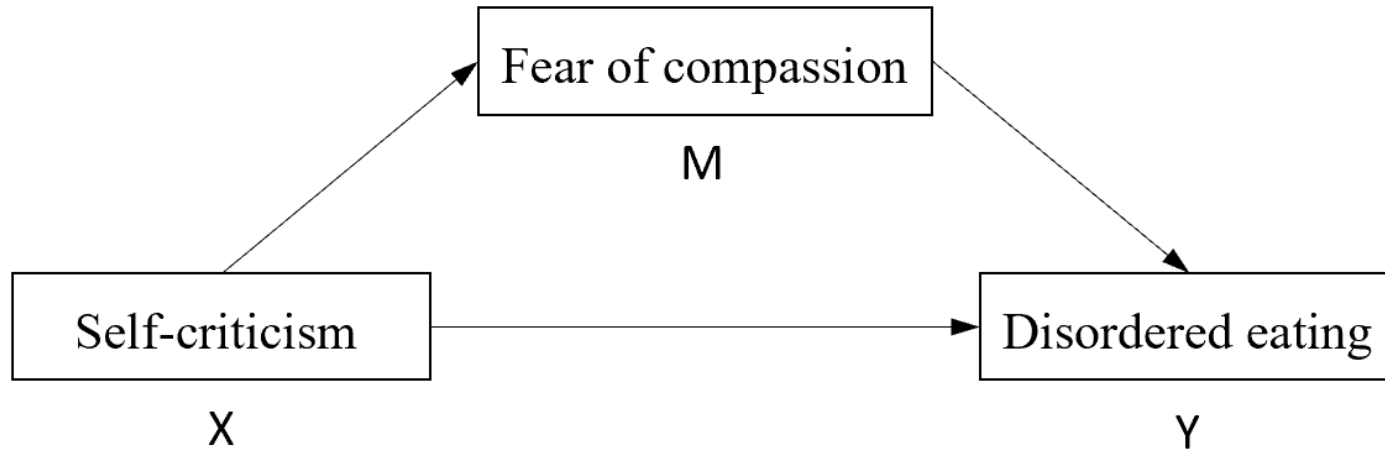


Figure 2. Simple mediation models for the indirect effect of self-critical rumination on disordered eating through fear of compassion

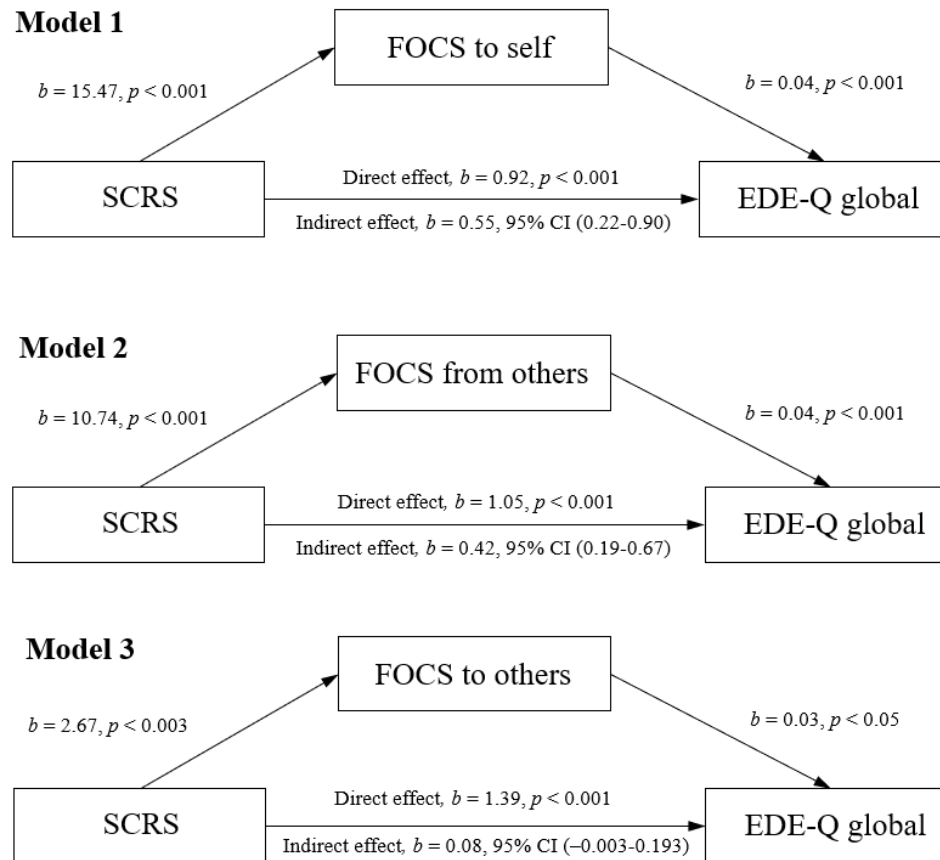
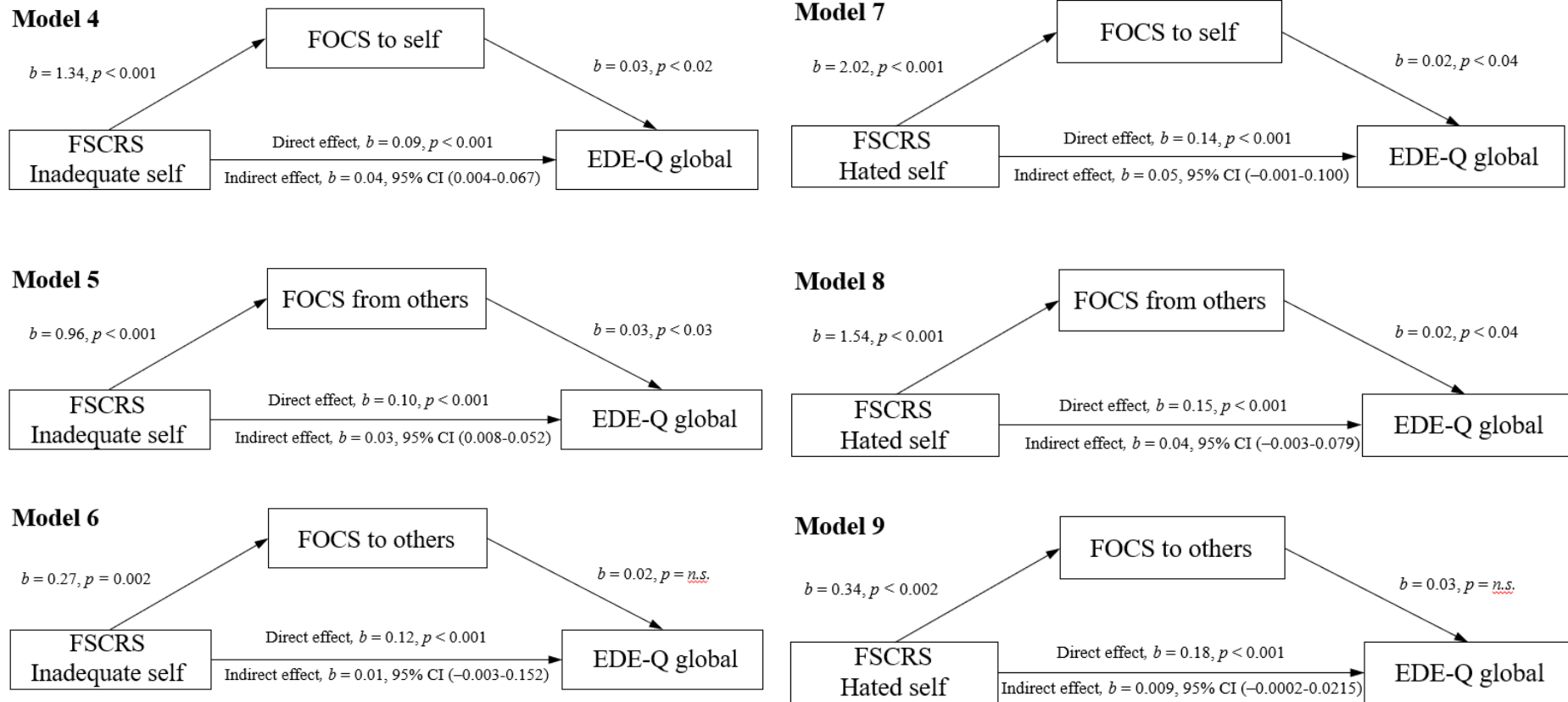


Figure 3. Simple mediation models for the indirect effect of self-criticism (inadequate self and hated self) and on disordered eating through fear of compassion



Appendix A: Submission guidelines for target journal *Eating Disorders: The Journal of Treatment and Prevention*

### **Review Papers**

Should be written with the following elements in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list)

Should be between 6000 and 8000 words, inclusive of the abstract, tables, references, figure captions.

Should contain an unstructured abstract of 200 words.

We encourage submissions of review articles that are timely and relevant to clinicians and clinical researchers. Reviews should be systematic reviews or meta-analyses, and should follow a structured reporting format such as PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

### **Style Guidelines**

Please refer to these quick style guidelines when preparing your paper, rather than any published articles or a sample copy.

Any spelling style is acceptable so long as it is consistent within the manuscript.

Any form of consistent quotation style is acceptable. Please note that long quotations should be indented without quotation marks.

Part of the mission of EDJTP is to disseminate cutting edge research on eating disorders to clinicians, academics, advocates, and sufferers. Thus, we have a social media editor, and we make it a priority to publicize articles through social media outlets. Authors can help generate publicity for their own articles by posting articles, or sharing EDJTP 's posts. (Find us on Twitter @Eating disordersJTP and Facebook.)

### **Formatting and Templates**

Papers may be submitted in Word format. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting template(s).

Word templates are available for this journal. Please save the template to your hard drive, ready for use.

If you are not able to use the template via the links (or if you have any other template queries) please contact us here.

The journal's peer-review process follows the journal program guidelines of the American Psychological Association (APA), Publication Manual, 6th Edition. As this manual is updated, Eating Disorders will adjust its processes to accommodate alterations made to this manual. The APA website include a range of resources, such as An overview of the



Publication Manual of the American Psychological Association, Sixth Edition; and free tutorials on APA Style basics and an APA Style Blog. Note, manuscripts submitted that are not in APA style will not be sent to reviewers and will be returned to the authors. All submissions will be screened using duplication software. All manuscripts with scores higher than 12% will be returned to the authors for editing to reduce replicated material. The text should be presented in the following order: (1) Title Page, which should include the full names of all authors, the authors' institutional affiliations where the work was conducted, with a footnote for an author's present address if different to where the work was carried out, and any Acknowledgements (2) Abstract and Keywords. The abstract should be running text without subheadings. Please provide five to seven keywords. (3) Clinical Implications. Clinical Implications are required for each article, in keeping with our journal's mission of publishing research that is clinically applicable and practical. They consist of a short list of bullet points that convey the core findings and clinical implications of the article and should be submitted under the abstract in the online submission system. Please use 'Clinical Implications' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point; no acronyms). (4) Blinded Manuscript, which should include a title, a short running title of less than 40 characters, and the main text: double-spaced, with numbered manuscript pages (5) References (6) Tables, Figures, and Color Illustrations. Illustrations submitted (line drawings, halftones, photos, photomicrographs, etc.) should be clean originals or digital files. Digital files are recommended for highest quality reproduction and should follow these guidelines: 300 dpi or higher, sized to fit on journal page, EPS, TIFF, or PSD format only, submitted as separate files, not embedded in text files

**Checklist:** What to Include

**Author details.** All authors of a manuscript should include their full name and affiliation on the cover page of the manuscript. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. Read more on authorship. You can opt to include a video abstract with your article. Find out how these can help your work reach a wider audience, and what to think about when filming.

**Funding details.** Please supply all details required by your funding and grant-awarding bodies as follows:

**For single agency grants**

This work was supported by the [Funding Agency] under Grant [number xxxx].

**For multiple agency grants**

This work was supported by the [Funding Agency #1] under Grant [number xxxx]; [Funding Agency #2] under Grant [number xxxx]; and [Funding Agency #3] under Grant [number xxxx].

**Disclosure statement.** This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research. Further guidance on what is a conflict of interest and how to disclose it.

**Data availability statement.** If there is a data set associated with the paper, please provide information about where the data supporting the results or analyses presented in the paper can be found. Where applicable, this should include the hyperlink, DOI or other persistent identifier associated with the data set(s). Templates are also available to support authors.

**Data deposition.** If you choose to share or make the data underlying the study open, please deposit your data in a recognized data repository prior to or at the time of submission. You will be asked to provide the DOI, pre-reserved DOI, or other persistent identifier for the data set.

**Supplemental online material.** Supplemental material can be a video, dataset, fileset, sound file or anything which supports (and is pertinent to) your paper. We publish supplemental material online via Figshare. Find out more about supplemental material and how to submit it with your article.

**Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for color, at the correct size). Figures should be supplied in one of our preferred file formats: EPS, PDF, PS, JPEG, TIFF, or Microsoft Word (DOC or DOCX) files are acceptable for figures that have been drawn in Word. For information relating to other file types, please consult our Submission of electronic artwork document.

**Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.

**Equations.** If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about mathematical symbols and equations.

**Units.** Please use SI units (non-italicized).

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### **Section Three: Critical Appraisal**

Word count (excluding references, tables and appendices): 3,103

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## **Main findings**

### ***Systematic literature review***

The systematic literature review examined the relationship between post-traumatic stress disorder (PTSD) and eating disorders within a military population through identifying and synthesising results from 12 quantitative research papers. Findings of the review indicate that there is a significant positive association between PTSD and eating disorders in military populations, with greater severity of PTSD being linked to greater severity of eating disorder symptoms. Further, they suggest that females are at greater likelihood than males of experiencing co-occurring PTSD and eating disorders.

### ***Main paper***

The main research paper was underpinned by theory linking self-criticism to disordered eating and the potential for compassion to affect this relationship. Mediational models were used to examine the effect of fear of compassion on self-criticism and disordered eating. Significant indirect effects of higher levels self-criticism on increased levels of disordered eating through fear of receiving compassion from others or from the self were identified. Findings highlighted processes related to fear of receiving compassion, either internally from the self or externally from others, as potentially key mechanisms underpinning the relationship between self-criticism and disordered eating behaviours. Clinical implications for engagement and therapeutic progress for individuals experiencing disordered eating were identified which included a need for early assessment of fear of compassion, particularly in those known to be self-critical. However, a need was also evident to further understand the role of other potentially influential factors such as shame, particularly in the context of forms of self-criticism related to self-hatred.

## **Decision-making, challenges, and opportunities for improvement**

At numerous points throughout this piece of work, from the initial inception of ideas to constructing the final report, decisions were made that inevitably influenced its course. I will attempt to elucidate and reflect upon some of these decisions below.

### *Systematic literature review*

#### *Research question*

A crucial decision point in the early stages of the development of this project was defining the research question for the systematic review. I was determined to set the focus of the overall thesis, including the review, in an area in which I was genuinely interested. My starting point was eating disorders, primarily due to clinical experience which had made me curious about the function of eating difficulties in relation to coping with difficult emotions. Initial searches of the literature brought me to a question that had not yet been explored in relation to post-traumatic stress disorder (PTSD) and eating disorders. Unfortunately, time and resource constraints meant that for the purposes of this thesis it would not have been feasible to review the vast amount of relevant research that was available. However, during this scoping exercise I noticed a number of papers that focused on military populations. Recognising a need to narrow my search in order to make the review more manageable led me to consider the relationship between PTSD and eating disorders in the military. Although PTSD is far from the main or only source of psychological distress in military personnel and veterans (Iversen et al., 2009; Sundin, Fear, Iverson, Rona, & Wessley, 2010), a review of its relationship with eating disorders could potentially generate important clinical implications for this population. Furthermore, the structure and stress brought through the military regime, and expectations placed on military service members, are potentially influential factors in the development of unsafe dieting and eating behaviours in military men and women e.g. combat exposure, military

sexual trauma, worry related to passing physical fitness assessments, pressure to maintain body weight according to external standards, and bullying and pressure from colleagues (Bartlett & Mitchell, 2015; Carlton, Manos, & Van Slyke, 2005; Lauder & Campbell, 2001; McNulty, 2001).

### *Search strategy*

I believe that my thorough approach to the development of a robust search strategy reflects a strength of the review. In order to ensure that my search terms were as accurate and inclusive as possible I took a rigorous approach of reviewing numerous other systematic reviews related to each of the concepts in my search. In doing so it highlighted to me the vast range of terms related to the concept of military which, without having compared terms from several other published reviews, I may have overlooked. Through doing so I became aware that, perhaps naively, I would have failed to identify terms such as ‘troop’, ‘active duty’, and ‘special forces’. I developed a unique search strategy for each database ensuring that I used medical subject headings and thesauruses where possible and my final search strategy was approved by an academic librarian. In line with a previous systematic review I had undertaken, I made an explicit decision to limit my search for the concept of eating disorders to include only terms linked to formal diagnoses. Although this did not fit with my own views on diagnosis and use of diagnostic language, this was a novel area and therefore I wanted in the first instance to examine research specifically related to formal eating disorder diagnoses. I am aware that reviews including more general aspects of diagnostic criteria, such as binge eating, could add to our understanding of individuals’ relationship with food and eating more generally. I would therefore be interested to find from future reviews how different types of psychological distress, including but not limited to PTSD, relate to all forms of disordered eating behaviours and not just those identified formally as eating disorders.

Through not limiting the search by military branch, date, or country of publication I had aimed to include international research on both active military service members and veterans. In spite of this, the papers included in this review were still dominated by research related to US army veterans. I felt this reflected a bias in the body of research concerning eating disorders in the military which has highlighted areas that demand more research. These relate to research on eating disorders in the UK military and veteran population as well as international research concerning other branches of the military such as the navy, marines, and air force.

### *Quality appraisal*

Quality appraisal of studies is generally viewed as an essential part of any systematic review as inclusion of methodologically poor studies can lead to significant distortion of the review outcome (Hayvaert, Hannes, Maes, & Onghena, 2013). I faced a dilemma when I came to critically appraise the quality of the papers included in my review. The search identified studies employing a mixture of methodological approaches that did not lend themselves easily to the use of any one particular quality appraisal tool. I was aware that other reviews had used the STROBE tool; however use of the STROBE for quality appraisal has been deemed inappropriate (da Costa, Cervallos, Altman, Rutjes, & Egger, 2011). I then identified the Effective Public Health Practice Project (EPHPP) tool (National Collaborating Centre for Methods and Tools, 2008) as having been developed to assess studies using all types of observational designs, therefore originally I used it to assess all of the papers included in the review. However, the process of actually using the tool revealed what I felt was a weakness in its ability to assess cross-sectional studies.

Almost all of the areas examined in the EPHPP were either not relevant to cross-sectional designs, or would be rated as 'weak' due to the very nature of cross-sectional designs

and their position lower down in the hierarchy of research evidence. I found that using this tool in this way added very little in the way of critical appraisal of cross-sectional studies. This led me seek out another tool that might offer a more comprehensive appraisal of these studies and in this regard I identified the AXIS tool (Downes, Brennan, Williams, & Dean, 2016). The AXIS tool was developed specifically for cross-sectional studies using a Delphi approach. It features in-depth items and probes that are relevant to this particular study design and addresses overall study design, reporting quality, and risk of bias. Comparing appraisal outcomes between the EPHPP and the AXIS for the nine cross-sectional studies that formed the bulk of my review, I found that the AXIS allowed me engage more critically with the papers and facilitated the identification of more useful information related to strengths and weaknesses of each study than the EPHPP. Of course, this meant that I was in a position where I needed to decide whether to use one overarching tool that could assess all studies but which I felt performed less effectively for cross-sectional studies that formed the majority of papers included in the review, or two tools which I felt offered more robust quality appraisal for the respective study designs overall. I searched the literature concerning quality appraisal in order to inform my decision-making here but unfortunately I could not identify a definitive answer, nor any other research papers that had employed two separate tools. Although I was aware that by using two separate tools I would not be able to directly compare the outcomes of quality appraisal for each individual study with one another, such as ratings or rankings, I felt that taking this approach would overall produce a more meaningful and thorough appraisal of the papers.

My aim was to appraise quality of individual studies to allow me to identify any key strengths or weaknesses that I might need to consider within my synthesis. I was not using quality appraisal as a way of directly comparing studies with one another, or indeed excluding



any studies based on rating or ranking. I therefore chose to use two tools to perform what I felt was a more thorough appraisal overall, than use one to adhere to common practice.

## ***Research paper***

### *Survey design and measures*

Some of the most important decisions following the development of the initial research question for my empirical study concerned the design of the online survey and measurement of the key variables. When deciding which measures to use, I needed to consider a number of factors including reliability and validity, availability (in terms of cost and permission), user-friendliness/accessibility, and length. As far as I was aware, at the time of making these choices there was only one scale that measured fear of compassion therefore this was an obvious choice to include. However, numerous scales exist for measurement of both self-criticism and disordered eating behaviours. My decision to use both the Self-Critical Rumination Scale (Smart, Peters, & Baer, 2016) and the Functions of Self-Criticising/Reassurance Scale (Gilbert, Clarke, Hempel, Miles, & Irons, 2004) came through reviewing the outcome of a recent systematic review examining measures of self-criticism (Rose & Rimes, 2018). Both the SCRS and the FSCRS were free-to-use (although I was required to seek the author's permission to use the SCRS), performed well psychometrically, and I felt they were user-friendly and brief enough to include in the survey. Furthermore, each had been used in other research studies which I thought might allow for future comparisons between study outcomes. In relation to measuring disordered eating behaviours, I chose the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994) from a range of possible options. Again, this measure is widely used in other studies; it was free-to-use and well validated. Although I felt it was somewhat more burdensome to complete, it was aligned with its equivalent diagnostic interview, the Eating Disorder Examination (Fairburn, Cooper, & O'Connor, 1993), and it was

accompanied by clinical norms and cut-off scores which might have been useful for analysis purposes i.e. group comparisons.

Once the measures were chosen, there were some practical and ethical choices to consider in relation to the design of the survey. One such choice related to forced responses with the online survey. It seemed that there was a balance to be struck between wanting to give participants a choice, particularly in relation to answering potentially emotive or difficult questions, and maximising the final data set through minimising missing data. In order to find a middle ground, I chose to include forced responses for all demographic questions for each of which there was a 'prefer not to say' option. For all other questions (i.e. the scales measuring each of the main variables) I designed the survey in a way which meant that participants were shown a pop-up prompt drawing their attention to any missed questions, yet leaving responding as optional to them. I hoped that this would limit accidentally missed responses yet still give participants a choice about whether or not to respond. Although it was possible that this approach could have adversely affected the data set by contributing to potentially larger volumes of missing data, in my judgment I felt it was the most appropriate from an ethical perspective, and when results were in there were very few participants who missed items or scales.

Being mindful of the potentially triggering nature of some of the questions, particularly those related to disordered eating, I ensured that the participant information sheet made clear and emphasised the potential risks related to participation. Whilst this is an important component of any well-conducted research, I felt it was particularly pertinent for research within the field of eating disorders. Prior to potentially triggering question sets, I included a page that warned the participant of this prior to displaying the questions. In addition, I was careful to include supportive resources in the event of any participant being concerned about the physical or mental wellbeing of themselves or others.

*Involvement of 'experts by experience'*

At Lancaster University, there is a strong ethos regarding involvement of community stakeholders, carers, members of the public, professionals, and people with lived experience of accessing services in all aspects of the delivery of the DClinPsy course including trainees' research projects. In this regard I was fortunate to be able to consult people with lived and professional experience of eating disorders through the national charity Beat. This charity have a well-established research participation agenda in terms of user involvement in research and promotion of projects.

The feedback I received on my online survey was invaluable albeit more difficult to navigate and synthesise than originally expected. Inevitably, there were different views on aspects of the survey which I had to consider carefully, such as those related to length of completion. I needed to balance the views of those I consulted with the overall needs of the study. For example, one person remarked that one of the questionnaires was quite long and provided feedback regarding changes to the predetermined response options. Given that many questionnaires are validated based on their original structure and format, and authors often request that questionnaires are not adapted, I was not able to make some of the changes indicated by consultants' feedback. This created some conflict for me between wanting to value and respond to feedback at the same time as protecting the integrity of my study. In an effort to resolve this I responded to the feedback of each of the consultants individually. I expressed gratitude for their input and provided information as to how and where it had influenced survey design or, where applicable, gave explanations about why their suggestions could not be incorporated. In future research projects I would ideally like to involve people with lived experience or 'service user consultants' and researchers from inception to completion of projects.

### *Recruitment*

Prior to beginning recruitment I was already aware that males in particular are underrepresented in both clinical eating disorder services and eating disorder research (Murray et al., 2017). This influenced my recruitment strategy in that I sought additional channels for promotion in addition to the main avenues which were related to eating disorders and compassion in general. I promoted the research via the social networking sites of charities set up for men with eating disorders, key ambassadors for men with eating disorders, and prominent academic figures in the field of male eating disorder research. I hoped to achieve a proportion of males in the sample that was at least approaching the estimated proportion of males who are thought to experience disordered eating.

As detailed in my ethical application, I had planned promote the study via recruitment channels and agreements with the eating disorders charity 'Beat', a local non-NHS eating disorders service, and via Lancaster University's research portal that would have advertised the study to students. Unfortunately, once I had received ethical approval, I did not receive any further communication from either party despite attempts to get in touch. In the meantime, promotion of my online study advertisement via social media was creating a huge uptake in study participation and I achieved my recruitment target within a matter of weeks. Monitoring the data to ensure that I was achieving a balance of people who did and did not identify with an eating disorder, I took the decision not to pursue any further avenues of recruitment. On reflection, I appreciate that it is possible that I could have achieved a bigger and potentially more diverse sample had I continued with pursuing all aspects of my originally proposed recruitment strategy.

### *Data analysis*

I chose to complete multiple simple mediations for the main study. I had made this decision early in the design of the study and considered issues of power and sample size based on this decision. However, following data collection I learned about parallel and serial mediation. Parallel mediation analysis including three mediators was not considered to be appropriate as, although mediators are permitted to correlate, they should not be theoretically related (Hayes, 2018), and there is a potential theoretical relationship between dimensions regarding the receipt of compassion both internally and externally (e.g. fear of compassion to self may be related to fear of compassion from others; Gilbert, McEwan, Matos, & Rivis, 2011). On reflection, I would have liked to perform a serial mediation analysis (Hayes, 2018) but I believe that my sample size would not have been large enough based on Pieters' (2017) estimations.

Finally, I did include the depression subscale of the DASS-21 (Lovibond & Lovibond, 1995) when collecting data. The DASS-21 is a self-report measure designed to assess perceived severity of symptoms related to depression, anxiety, and stress using 21 items each rated on a Likert scaled ranging between '0' ("never") and '4' ("almost always"). It is well validated amongst clinical and non-clinical populations (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005). I included this measure with an aim of being able to compare results with other studies examining the effects of depression in relation to self-criticism and disordered eating. Ultimately, however, it was not used to compare with or replicate other research as I needed nine mediation models to just to focus on the key variables. It would be of interest, but outside the scope of the current thesis, therefore to look at this within future research.

## References

- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176-181. doi:10.1037/1040-3590.10.2.176
- Bartlett, B. A., & Mitchell, K. S. (2015). Eating disorders in military and veteran men and women: A systematic review. *International Journal of Eating Disorders, 48*(8), 1057-1069.
- Carlton, J. R., Manos, G. H., & Van Slyke, J. A. (2005). Anxiety and Abnormal Eating Behaviors Associated with Cyclical Readiness Testing in a Naval Hospital Active Duty Population. *Military Medicine, 170*(8), 663-667. doi:10.7205/milmed.170.8.663
- da Costa, B. R., Cevallos, M., Altman, D. G., Rutjes, A. W. S., & Egger, M. (2011). Uses and misuses of the STROBE statement: bibliographic study. *BMJ Open, 1*(1), e000048. doi:10.1136/bmjopen-2010-000048
- Downes, M. J., Brennan, M. L., Williams, H. C., & Dean, R. S. (2016). Development of a critical appraisal tool to assess the quality of cross-sectional studies (AXIS). *BMJ Open, 6*(12), e011458. doi:10.1136/bmjopen-2016-011458
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*(4), 363-370.
- Fairburn, C. G., Cooper, Z., & O'Connor, M. (1993). The eating disorder examination. *International Journal of Eating Disorders, 6*, 1-8.
- Gilbert, P., Clarke, M., Hempel, S., Miles, J. N. V., & Irons, C. (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *43*(1), 31-50. doi:10.1348/014466504772812959

- Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: development of three self-report measures. *Psychol Psychother*, *84*(3), 239-255.  
doi:10.1348/147608310x526511
- Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Communication Monographs*, *85*(1), 4-40.
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol*, *44*(Pt 2), 227-239. doi:10.1348/014466505x29657
- Iversen, A. C., van Staden, L., Hughes, J. H., Browne, T., Hull, L., Hall, J., . . . Wessely, S. (2009). The prevalence of common mental disorders and PTSD in the UK military: using data from a clinical interview-based study. *BMC psychiatry*, *9*(1), 68.
- Lauder, T. D., & Campbell, C. S. (2001). Abnormal Eating Behaviors in Female Reserve Officer Training Corps Cadets. *Military Medicine*, *166*(3), 264-268.  
doi:10.1093/milmed/166.3.264
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther*, *33*(3), 335-343.
- McNulty, A. F. (2001). Prevalence and Contributing Factors of Eating Disorder Behaviors in Active Duty Service Women in the Army, Navy, Air Force, and Marines. *Military Medicine*, *166*(1), 53-58. doi:10.1093/milmed/166.1.53
- Smart, L. M., Peters, J. R., & Baer, R. A. (2016). Development and Validation of a Measure of Self-Critical Rumination. *Assessment*, *23*(3), 321-332.  
doi:10.1177/1073191115573300

Sundin, J., Fear, N. T., Iversen, A., Rona, R. J., & Wessely, S. (2010). PTSD after deployment to Iraq: conflicting rates, conflicting claims. *Psychological Medicine*, 40(3), 367-382.

Tools, N. C. C. f. M. a. (2008). Quality assessment tool for quantitative studies. *Hamilton: The Effective Public Health Practice Project*. URL: [http://www.ephpp.ca/PDF/Quality% 20Assessment, 20](http://www.ephpp.ca/PDF/Quality%20Assessment,20).



**Section Four: Ethics Section**

The effect of fear of compassion on self-criticism and eating disordered behaviour

Word count (excluding references, tables and appendices): 4,262

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1. Lancaster University Faculty of Health and Medicine Research Ethics Committee  
ethical application form



Faculty of Health and Medicine Research Ethics Committee (FHMREC)  
Lancaster University

Application for Ethical Approval for Research

Title of Project: The effect of fear of compassion on self-criticism and eating disordered behaviour	
Name of applicant/researcher: Katy Hughes	
ACP ID number (if applicable)*: N/A	Funding source (if applicable) N/A
Grant code (if applicable): N/A	
*If your project has <i>not</i> been costed on ACP, you will also need to complete the Governance Checklist <a href="#">[link]</a> .	

Type of study
<input type="checkbox"/> Involves existing documents/data only, or the evaluation of an existing project with no direct contact with human participants. Complete sections one, <i>two</i> and four of this form
<input checked="" type="checkbox"/> Includes <i>direct</i> involvement by human subjects. Complete sections one, <i>three</i> and four of this form

SECTION ONE

1. Appointment/position held by applicant and Division within FHM	Trainee Clinical Psychologist, Division of Health Research
2. Contact information for applicant:	
E-mail: k.hughes4@lancaster.ac.uk	Telephone: 07827 920798 (please give a number on which you can be contacted at short notice)
Address: Doctorate in Clinical Psychology, Division of Health Research, Faculty of Health and Medicine, Furness College, Lancaster University, Lancaster LA1 4YG	
3. Names and appointments of all members of the research team (including degree where applicable)	
Katy Hughes, Trainee Clinical Psychologist (Principal Investigator)	
Dr Fiona Eccles, Lecturer (Research Supervisor)	
Dr Hannah Wilson, Clinical Psychologist (Field Supervisor)	
Dr Kathryn Pemberton, Clinical Psychologist (non-supervisory expert consultant)	

3. If this is a student project, please indicate what type of project by marking the relevant box/deleting as appropriate: (please note that UG and taught masters projects should complete FHMREC form UG-TPG, following the procedures set out on the <a href="#">FHMREC website</a> )
--

PG Diploma  Masters by research  PhD Thesis  PhD Pall. Care   
 PhD Pub. Health  PhD Org. Health & Well Being  PhD Mental Health  MD   
 DClinPsy SRP  [if SRP Service Evaluation, please also indicate here: ] DClinPsy Thesis

4. Project supervisor(s), if different from applicant: Dr Fiona Eccles; Dr Hannah Willson

5. Appointment held by supervisor(s) and institution(s) where based (if applicable): Dr Fiona Eccles (Lecturer, Lancaster University); Dr Hannah Wilson (Clinical Psychologist, Salford Royal NHS Foundation Trust)

## SECTION TWO

Complete this section if your project involves existing documents/data only, or the evaluation of an existing project with no direct contact with human participants

1. Anticipated project dates (month and year)

Start date: \_\_\_\_\_ End date: \_\_\_\_\_

2. Please state the aims and objectives of the project (no more than 150 words, in lay-person's language):

### Data Management

For additional guidance on data management, please go to [Research Data Management](#) webpage, or email the RDM support email: [rdm@lancaster.ac.uk](mailto:rdm@lancaster.ac.uk)

3. Please describe briefly the data or records to be studied, or the evaluation to be undertaken.

4a. How will any data or records be obtained?

4b. Will you be gathering data from websites, discussion forums and on-line 'chat-rooms'  no

4c. If yes, where relevant has permission / agreement been secured from the website moderator?  no

4d. If you are only using those sites that are open access and do not require registration, have you made your intentions clear to other site users?  no

4e. If no, please give your reasons

5. What plans are in place for the storage, back-up, security and documentation of data (electronic, digital, paper, etc)? Note who will be responsible for deleting the data at the end of the storage period. Please ensure that your plans comply with General Data Protection Regulation (GDPR) and the (UK) Data Protection Act 2018.

6a. Is the secondary data you will be using in the public domain?  no

6b. If NO, please indicate the original purpose for which the data was collected, and comment on whether consent was gathered for additional later use of the data.

Please answer the following question *only* if you have not completed a Data Management Plan for an external funder

7a. How will you share and preserve the data underpinning your publications for at least 10 years e.g. PURE?

7b. Are there any restrictions on sharing your data?

**8. Confidentiality and Anonymity**

a. Will you take the necessary steps to assure the anonymity of subjects, including in subsequent publications?

yes

b. How will the confidentiality and anonymity of participants who provided the original data be maintained?

9. What are the plans for dissemination of findings from the research?

10. What other ethical considerations (if any), not previously noted on this application, do you think there are in the proposed study? How will these issues be addressed?

**SECTION THREE**

Complete this section if your project includes *direct* involvement by human subjects

1. Summary of research protocol in lay terms (indicative maximum length 150 words):

This study aims to develop an understanding of the nature of the relationship between 'fear of compassion', 'self-criticism', and eating disordered behaviour. Research indicates that there is a pre-existing relationship between self-criticism and eating disorders wherein higher levels of self-criticism are predictive of more severe eating disorder presentations. A similar relationship between self-criticism and depression has also been established. At present, psychological interventions such as, but not limited to, Compassion Focused Therapy include modules targeting self-criticism as a way of promoting therapeutic change. If fear of compassion of any type (either showing 'to self', 'to others', or receiving 'from others') mediates the relationship between self-criticism and eating disorder symptoms, this may hold clinical and theoretical implications. From a clinical practice perspective, this may include a shift in the focus of an intervention from addressing self-criticism to prioritising issues related to fear of compassion which may act as a barrier to therapeutic change if left unaddressed.

2. Anticipated project dates (month and year only)

Start date: February 2019

End date: May 2019

**Data Collection and Management**

For additional guidance on data management, please go to [Research Data Management](#) webpage, or email the RDM support email: [rdm@lancaster.ac.uk](mailto:rdm@lancaster.ac.uk)

3. Please describe the sample of participants to be studied (including maximum & minimum number, age, gender):

Participants eligible for the study will include English-speaking adults (aged 18 or over) not limited by gender who are able to indicate their consent and complete an online survey. Participants must be based in the United Kingdom. For a mediation analysis Fritz and MacKinnon (2007) suggest a sample size of 71 based on medium effect sizes for both paths of the mediation model (i.e. 'X→M' and 'M→Y') using a bias-corrected bootstrap method. The study will therefore seek to recruit a minimum of 71 and a maximum of 300 participants from clinical and non-clinical settings in order to gain a wide distribution of scores on the eating disorder scale.

**Inclusion criteria:**

- Aged 18 or over
- Able to give consent
- Able to access and complete the online survey

**Exclusion criteria:**

- Non-English speakers

4. How will participants be recruited and from where? Be as specific as possible. Ensure that you provide the *full versions* of all recruitment materials you intend to use with this application (eg adverts, flyers, posters).

In order to gain a wide variety of participants this study will aim to recruit from several sources including:

- The national eating disorder charity 'Beat'. Beat is ideally placed to enable the identification of a pool of potentially suitable participants who have experienced difficulties within their relationship with food and eating, many of whom may also have received an eating disorder diagnosis. They have agreed to promote the study on their research page <https://www.beateatingdisorders.org.uk/eating-disorders-research> and via social media (e.g. Twitter). Promotion via Beat's website and social media platforms will extend opportunities for participation to a wider geographical area including people across the UK. Beat are actively involved in research as part of their agenda and have a dedicated section on their website for the promotion of research.
- The Compassionate Mind Foundation have also been approached in the same regard and asked to include the study on their research register (their response is yet to be confirmed)
- The study advert will also be shared with various professional, clinical, and academic agencies who have a presence on Twitter in relation to research on eating disorders and compassion e.g. the 'Eating Behaviours and Disorders Research Group' at the University of Edinburgh, 'FREED from ED', 'King's College ED Research', 'British Eating Disorders Society'
- A local non-NHS eating disorder service ('S.E.E.D.') <http://www.seedeatingdisorders.org.uk/> (to be confirmed)
- People from non-clinical populations including the community and staff/students at Lancaster University.

Lancaster University have agreed to advertise the study to on their research webpage (<https://www.lancaster.ac.uk/research/participate-in-research/>) as well as to students on the 'Psychology Research Participation System'.

As above, the study will be promoted online (using the electronic study advertisement – see Appendix A) including on social media sites (e.g. Facebook, Twitter, Workplace) and the websites of promoting organisations including Beat. Posts from social media that are shared by Beat and other agencies will be re-shared via the Principal Investigator's dedicated study Twitter account in order to increase likelihood of uptake.

5. Briefly describe your data collection and analysis methods, and the rationale for their use.

An online survey has been developed using Qualtrics (see [https://lancasteruni.eu.qualtrics.com/jfe/form/SV\\_9S6Kkmy2gXSaStT](https://lancasteruni.eu.qualtrics.com/jfe/form/SV_9S6Kkmy2gXSaStT); a copy is also available in Appendix B). The following data will be collected within the survey:

- Demographics (collected in order to produce descriptive statistics on the data and compare groups):
  - gender, age, ethnicity, employment status, partnership status
- Standardised measures (see below for rationale):
  - 10-item 'Self-critical rumination scale' (SCRS; Smart, Peters & Baer, 2015)
  - 22-item 'Forms of self-criticism and self-reassurance scale' (FSCRS; Gilbert, Clark, Hempel, Miles & Irons, 2004)
  - 38-item 'Fears of compassion scale' (FOCS; Gilbert, McEwan, Matos & Rivas, 2011)
  - 28-item 'Eating Disorder Examination Questionnaire' (EDE-Q; Fairburn & Beglin, 1994)
  - 7-item depression subscale from the 21-item 'Depression, Anxiety and Stress Scale' (DASS-21; Lovibond & Lovibond, 1995)

The measures of self-criticism were chosen based upon a recent systematic review of tools developed to measure self-criticism (Rose & Rimes, 2018). The outcome of the review was that the SCRS focused on repeated self-critical thinking and was recommended for research use due to consistently high ratings in terms of reliability and validity.

The FSCRS was also recommended by the review for similar purposes and differs from the SCRS in that it was developed for assessing self-criticism specifically in response to a perceived negative event. Both the SCRS and the FSCRS have been used previously in other research (e.g. Gilbert, Durrant & McEwan, 2006; Hermanto et al., 2016; Moreira & Canavarro, 2018; Pinto-Gouveia, Castilho, Matos & Xavier, 2013; Rose, McIntyre & Rimes, 2018).

The FOCS is the only scale available that measures fear of compassion and it has also been used extensively in other research (e.g. Hermanto et al., 2016; Joeng & Turner, 2015; Kelly, Carter, Zuroff & Borairi, 2013).

The EDE-Q is used widely in both clinical and research contexts as a well-validated tool for measuring eating disorder symptomatology.

The depression subscale from the DASS-21 was chosen to allow comparison in the current study with previous research exploring the relationships between depression, fear of compassion, and self-criticism (e.g. Gilbert,



McEwan, Matos & Rivas, 2011; Gilbert, McEwan, Caterino, & Baião, 2014). The rationale for using the depression subscale rather than the whole scale was to limit participant burden in completing the online survey. A study published by Lovibond and Lovibond (1995b) suggests that, psychometrically, the depression subscale compares well to other depression measures (e.g. Beck Depression Inventory; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

• Additional eating disorder specific questions:

- Have you ever been given an eating disorder diagnosis? If so, which?
- Do you identify with any of the eating disorder diagnoses? If so, which?
- Have you ever been hospitalised as a result of an eating disorder?

These questions were included in order to be able to examine between-group differences e.g. how scores for those diagnosed with anorexia nervosa differ from those with bulimia nervosa etc. The question re hospitalisation serves as another indicator of severity and data of this type is routinely collected within eating disorders research.

Data will be analysed using linear multiple regression to test a theoretical mediational model using Hayes (2018) PROCESS tool. It is hypothesised that the relationship between 'self-criticism' (X) and eating disorder symptomatology (Y) will be mediated by 'fear of compassion' (M). T-tests will also be performed to compare difference between groups e.g. self-reported diagnosis, gender, those who score above and below the clinical cut-off score on the eating disorder measure etc.

6. What plan is in place for the storage, back-up, security and documentation of data (electronic, digital, paper, etc.)? Note who will be responsible for deleting the data at the end of the storage period. Please ensure that your plans comply with General Data Protection Regulation (GDPR) and the (UK) Data Protection Act 2018.

The Principal Investigator, Research Supervisor, Field Supervisor and other members of the administration team must all comply with the General Data Protection Regulation (GDPR) and the (UK) Data Protection Act 2018) with regards to the collection, storage, processing and disclosure of personal information and will uphold their core principles. All study data will be collected, securely stored and maintained in accordance with legislative frameworks governing data protection, research ethics and research governance.

For the purposes of conducting the study it will not generally be necessary to record participants' personal identifiable information such as name, telephone number and/or email address. Two exceptions to this are: a.) when a participant has chosen to opt-in to the £50 Amazon voucher prize draw, and b.) when a participant has chosen to opt-in to receive a summary of overall study results. In both of these instances, the participant will be redirected within the primary survey to a secondary survey requesting their email address and an indication whether the participant wants to opt-in to the prize draw, to receive a summary of results, or both. The data collected in this secondary survey will not be linked to the primary anonymised survey. This is made clear to participants within both surveys. After the prize draw is completed the Principal Investigator will permanently delete any records pertaining to such email correspondence. The same process will be followed in relation to circulation of summaries of study results. The Principal Investigator will forward an electronic £50 Amazon voucher to the winning participant via email in order to avoid requiring any further personal information e.g. name/address.

Survey data and email addresses collected will be stored separately to one another and securely within Qualtrics and then transferred directly onto Lancaster University's secure server. The Principal Investigator, Research Supervisor and Field Supervisor will have access to survey data for analysis and supervision purposes. Members of the DClinPsy research and programme administration team (e.g. the Research Co-ordinator) will also need to access study data for data storage purposes under the direction of the Research Supervisor. The Programme will securely store data electronically for a period of 10 years in accordance with their data retention policy. It is anticipated that data storage for this study will not exceed 50GB. A copy of data will also be deposited in Lancaster University's institutional data repository PURE for the same period of time and made available to other researchers on request. Any data that carries a risk of a participant being identified within their population as a result of particular characteristics will be withheld.

7. Will audio or video recording take place?  no  audio  video

a. Please confirm that portable devices (laptop, USB drive etc) will be encrypted where they are used for identifiable data. If it is not possible to encrypt your portable devices, please comment on the steps you will take to protect the data.

N/A

b What arrangements have been made for audio/video data storage? At what point in the research will tapes/digital recordings/files be destroyed?

N/A

Please answer the following questions *only* if you have not completed a Data Management Plan for an external funder

8a. How will you share and preserve the data underpinning your publications for at least 10 years e.g. PURE?

The DClinPsy Programme will securely store data electronically for a period of 10 years in accordance with their data retention policy. A copy of data will also be deposited in Lancaster University's institutional data repository PURE for the same period of time and made available to other researchers on request. Any data that carries a risk of a participant being identified within their population as a result of particular characteristics will be withheld.

8b. Are there any restrictions on sharing your data ?

Yes – as per section 6 above, data will only be shared with genuine researchers and anomalous demographic or clinical data which may potentially identify an individual may be withheld.

9. Consent

a. Will you take all necessary steps to obtain the voluntary and informed consent of the prospective participant(s) or, in the case of individual(s) not capable of giving informed consent, the permission of a legally authorised representative in accordance with applicable law?  yes

b. Detail the procedure you will use for obtaining consent?

The consent procedure is embedded within the online survey. Participants will be shown the Participant Information Sheet on the first page of the survey along with text explaining the importance of reading through the information in full. The contact details of the principal investigator are provided for participants who may wish to make contact to ask questions prior to taking part. The second page of the survey contains the Consent Form featuring six statements in response to which the participant must indicate that they agree by checking a box stating 'I consent to all six statements above and wish to take part in the study'. Only by clicking on this option will the rest of the survey be shown. If the participants selects the option to indicate that they do not agree/consent, the survey will end and this is made clear on the page.

10. What discomfort (including psychological eg distressing or sensitive topics), inconvenience or danger could be caused by participation in the project? Please indicate plans to address these potential risks. State the timescales within which participants may withdraw from the study, noting your reasons.

Risk of emotional distress

The questions within the survey are seeking information about participants' attitudes in terms of compassion and self-criticism; they also elicit responses in relation to low mood and eating disordered behaviour. As a result there is a risk that any of these aspects of the survey could cause emotional distress through prompting self-reflection. It may be difficult for some people to contemplate or bring things into awareness that had not previously been considered.

More specifically, the survey contains questions (in relation to eating, shape, weight, appearance etc.) that are potentially triggering for people who are experiencing difficulties in relation to their eating behaviour. In order to mitigate this risk, the presence of these types of questions is made clear in the Participant Information Sheet at the start, prior to the participant providing consent, and it is clear that such questions are optional. In addition, within the body of the survey, any potentially triggering questions are immediately preceded by warnings.

The study aims to recruit people from both clinical and non-clinical populations. Particularly for those from a non-clinical population, there may also be an additional risk of an individual becoming concerned about their eating behaviours and/or other aspects of their mental health.

In order to address the potential risks detailed above, the survey is explicit that the questionnaires are not diagnostic. A statement regarding what to do if you are concerned about your own or someone's else eating behaviour or mental health and a list of contact details for accessing support is displayed when a participant ends the survey. This information is included in the Participant Information Sheet in case the participant closes the browser part way through the survey and therefore does not reach the end statement.

11. What potential risks may exist for the researcher(s)? Please indicate plans to address such risks (for example, noting the support available to you; counselling considerations arising from the sensitive or distressing nature of the research/topic; details of the lone worker plan you will follow, and the steps you will take).

There is a low risk to the researcher for this project due to its online, anonymised and quantitative nature.

12. Whilst we do not generally expect direct benefits to participants as a result of this research, please state here any that result from completion of the study.

There may be no direct benefit to participation in this study except for the opportunity to enter the prize draw (see below). There may be a benefit to society through overall outcome of the research and participants may experience this as a positive factor.

13. Details of any incentives/payments (including out-of-pocket expenses) made to participants:

In order to aid recruitment, participants will be given the opportunity to enter a prize draw to win one of four £50 Amazon vouchers. Those participants opting into the prize draw will be asked to complete a second, unlinked survey (see section 6 above) in which they are simply asked to provide their email address. In order to choose the four winners, each entrant will be allocated a unique identifier ranging from '1' up to the total number of entrants. A random number generator drawing from the same range of numbers will then be used to determine the winners. The Principal Investigator will forward an electronic £50 Amazon voucher to the four winning participants via email in order to avoid requiring any further personal information e.g. name/address. Email addresses will be stored only within Qualtrics and deleted after completion of the prize draw. The Principal Investigator will not be able to link the email addresses from such correspondence to any data collected as part of the study. After the prize draw is completed, the Principal Investigator will permanently delete any data from the second survey.

14. Confidentiality and Anonymity

a. Will you take the necessary steps to assure the anonymity of subjects, including in subsequent publications?

yes

b. Please include details of how the confidentiality and anonymity of participants will be ensured, and the limits to confidentiality.

Completion of the primary online survey is on an anonymous basis. No personal identifiable information will be requested. If a participant has chosen to opt-in to the £50 Amazon voucher prize draw and/or receive a summary of study results they will be asked to complete a second, unlinked survey (see section 6 above) in which they are simply asked to provide their email address. Email addresses will be stored only within Qualtrics and deleted after completion of the prize draw. The Principal Investigator will not be able to link the email to any data collected as part of first anonymous survey. After the prize draw is completed, the Principal Investigator will permanently delete data from the second survey. This is made clear within the participant information sheet. The same process applies if a participant has requested a summary of study results.

15. If relevant, describe the involvement of your target participant group in the *design and conduct* of your research.

Three 'experts by experience' (EbE) linked to the charity Beat were consulted in the design of the research i.e. they viewed all of the study material (participant information sheet, consent form, online survey) and piloted the



survey using dummy data which was not retained. They gave qualitative feedback based on the following questions:

1. How do you feel about the title of the study?
2. What are your overall experiences of the survey? (i.e. takes too long, information not clear enough, too much information etc.)
3. Are there any parts that you find unacceptable for any reason? Perhaps too distressing, dislike of language etc.
4. Do the participant info and consent sections (at the start) seem OK?
5. Do you find the language used acceptable?
6. Any other comments

The EbEs were consulted regarding the title of the project which resulted in a choice of the words 'eating disordered behaviour' over other options. Several other amendments (such as pacing of questionnaires) were made to the structure of the survey as a result of EbE feedback. A member of staff with significant experience of reviewing eating disorder research studies at Beat also provided general feedback on all study materials.

16. What are the plans for dissemination of findings from the research? If you are a student, include here your thesis.

On completion of the study, data will be analysed and a report will be compiled by the Principal Investigator for submission to the Doctorate in Clinical Psychology programme for examination. It is hoped that should the data be sufficient, a separate report will also be prepared for journal publication purposes. Agencies involved in the promotion of the study (e.g. Beat, Compassionate Mind Foundation) will be offered a copy of the full study report as well as a brief summary. Participants will be given an opportunity to opt-in to receiving results via email and will receive the same. The same process for managing email contact details as for the prize draw (detailed in Section 14b above) will be followed.

A departmental presentation on the results of the study will be made to colleagues on the DClinPsy programme at Lancaster University and results may be used for similar purposes e.g. conferences.

17. What particular ethical considerations, not previously noted on this application, do you think there are in the proposed study? Are there any matters about which you wish to seek guidance from the FHMREC?

The primary ethical consideration for this study is the potential risk to participants of emotional distress as a result of completing the online survey, particularly those related to eating difficulties. However, this has been considered carefully and procedures (as detailed previously) have been put in place to reduce and manage this risk.

## SECTION FOUR: signature

Applicant electronic signature: Date 

Student applicants: please tick to confirm that your supervisor has reviewed your application, and that they are happy for the application to proceed to ethical review

Project Supervisor name (if applicable): Date application discussed 

## Submission Guidance

1. Submit your FHMREC application by email to Diane Hopkins ([fhmresearchsupport@lancaster.ac.uk](mailto:fhmresearchsupport@lancaster.ac.uk)) as two separate documents:
  - i. **FHMREC application form.**  
Before submitting, ensure all guidance comments are hidden by going into 'Review' in the menu above then choosing *show markup>balloons>show all revisions in line*.
  - ii. **Supporting materials.**  
Collate the following materials for your study, if relevant, into a single word document:
    - a. Your full research proposal (background, literature review, methodology/methods, ethical considerations).
    - b. Advertising materials (posters, e-mails)
    - c. Letters/emails of invitation to participate
    - d. Participant information sheets
    - e. Consent forms
    - f. Questionnaires, surveys, demographic sheets
    - g. Interview schedules, interview question guides, focus group scripts
    - h. Debriefing sheets, resource lists

Please note that you **DO NOT** need to submit pre-existing measures or handbooks which support your work, but which cannot be amended following ethical review. These should simply be referred to in your application form.

2. Submission deadlines:
  - i. Projects including direct involvement of human subjects [section 3 of the form was completed]. The *electronic* version of your application should be submitted to [Becky Case](#) by the committee **deadline date**. Committee meeting dates and application submission dates are listed on the [FHMREC website](#). Prior to the FHMREC meeting you may be contacted by the lead reviewer for further clarification of your application. Please ensure you are available to attend the committee meeting (either in person or via telephone) on the day that your application is considered, if required to do so.
  - ii. The following projects will normally be dealt with via chair's action, and may be submitted at any time. [Section 3 of the form has **not** been completed, and is not required]. Those involving:
    - a. existing documents/data only;
    - b. the evaluation of an existing project with no direct contact with human participants;
    - c. service evaluations.
3. You must submit this application from your Lancaster University email address, and copy your supervisor in to the email in which you submit this application

2. Research protocol

## **Study Protocol**

THE EFFECT OF FEAR OF COMPASSION ON SELF-CRITICISM AND EATING  
DISORDERED BEHAVIOUR

**Principal Investigator: Katy Hughes, Trainee Clinical Psychologist**

**Protocol Version 1.0 (22/01/2019)****Study Summary**

Study Title	The effect of fear of compassion on self-criticism and eating disordered behaviour
Study Design	Quantitative psychological research
Study Participants	Participants eligible for the study will include English-speaking adults (aged 18 or over) not limited by gender who are able to provide informed consent and complete an online survey. Participants must be based in the United Kingdom. Individuals can participate regardless of whether or not they have difficulties in their relationship with food and/or eating. A minimum of 71 participants will be recruited; the upper limit will be 300.
Planned Size of Sample (if applicable)	A minimum of 71 and a maximum of 300 participants will be recruited.
Planned Study Period	Planned start date: February 2019 Planned end date: May 2019
Research Question/Aim(s)	This study aims to develop an understanding of the nature of the relationship between ‘fear of compassion’, ‘self-criticism’, and eating disordered behaviour. At present, psychological interventions such as, but not limited to, Compassion Focused Therapy include modules targeting self-criticism as a way of promoting therapeutic change. If fear of compassion of any type (either showing ‘to self’ or ‘to others’, or receiving compassion ‘from others’) mediates the relationship between self-criticism and eating disorder symptoms, this may hold important clinical and theoretical implications.

**Key Study Contacts**

Principal Investigator	<p>Katy Hughes, Trainee Clinical Psychologist</p> <p>Address: Faculty of Health and Medicine Lancaster University Lancaster LA1 4YG</p> <p>Phone: 01524 592754</p> <p>Email: <a href="mailto:k.hughes4@lancaster.ac.uk">k.hughes4@lancaster.ac.uk</a></p>
Research Supervisor	<p>Dr Fiona Eccles, Lecturer</p> <p>Address: Faculty of Health and Medicine Lancaster University Lancaster LA1 4YG</p> <p>Phone: 01524 592807</p> <p>Email: <a href="mailto:f.eccles@lancaster.ac.uk">f.eccles@lancaster.ac.uk</a></p>
Field Supervisor	<p>Dr Hannah Wilson, Clinical Psychologist</p> <p>Address: Clinical Health Psychology Salford Royal NHS Foundation Trust Clinical Sciences Building</p>

	<p>Stott Lane</p> <p>Salford</p> <p>M6 8HD</p> <p>Phone: 01524 592730</p> <p>Email: <a href="mailto:Hannah.wilson3@srft.nhs.uk">Hannah.wilson3@srft.nhs.uk</a></p>
Expert Consultant	<p>Dr Kathryn Pemberton</p> <p>Address: East Lancashire Eating Disorder Service</p> <p>Pendle House</p> <p>Nelson</p> <p>BB7 9TG</p> <p>Phone: 01282 657920</p> <p>Email: <a href="mailto:Kathryn.pemberton@lancashirecare.nhs.uk">Kathryn.pemberton@lancashirecare.nhs.uk</a></p>

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## STUDY PROTOCOL

The effect of fear of compassion on self-criticism and eating disordered behaviour

### 1 BACKGROUND AND RATIONALE

Self-criticism is defined as how individuals evaluate themselves in comparison to their ideal self or their sense of how they are judged by others (Warren, Smeets & Neff, 2016). It has been shown to be a risk factor for a range of psychological difficulties including anxiety, depression, eating disorders, interpersonal problems, substance misuse, self-harm, and suicide (e.g. Kannan & Levitt, 2013; Warren, Smeets & Neff, 2016). The concept of self-criticism, however, may be regarded as existing on a continuum ranging from a healthy, reflexive process to one that has the potential to be harmful and maladaptive and hence a risk factor for further difficulties (Kannan & Levitt, 2013).

Campos, Besser & Blatt (2010) summarise a large body of evidence suggesting that early experiences of high control and a lack of parental warmth, and their subsequent impact on attachment and disruption in the development of the self, are linked to self-criticism in children. Targeting self-criticism is a common goal of psychotherapeutic interventions, particularly in compassion-focused work. Compassion, as a concept which is distinct from yet related to self-criticism (Longe, Maratos, Gilbert, Evans, Volker, 2010), concerns how one relates to oneself or others in intentional, kind, mindful and understanding ways when faced with suffering (Neff, 2003).

Compassion focused therapy (CFT) was specifically developed to help people to foster compassion and positive affiliative emotions in order to counter feelings of shame and self-criticism (Gilbert, 2009, 2010). Both individual and group CFT formats include specific foci on the 'self-critic'. In mental health research, higher levels of self-criticism predict increased depression (Dunckley, Sanislow, Grilo & McGlashan, 2009). Eating disorders research suggests that higher levels of self-criticism predict greater severity in eating disorder symptoms (Fennig et al., 2008). CFT has so far shown promising clinical outcomes in both of these populations (Goss & Allan, 2014; Leaviss & Uttley, 2015).

Whilst the role of self-compassion and compassion in relation to others (both showing and receiving) has been examined prolifically in the context of psychological and interpersonal wellbeing and coping (MacBeth & Gumley, 2012; Neff & Costigan, 2014), the role of fear of compassion (i.e. difficulty or aversion in showing compassion to oneself, to others, or receiving it from others) has only recently attracted research interest.

In people experiencing depression, a general difficulty in being self-compassionate and receiving compassion from others was identified (Gilbert, McEwan, Caterino, & Baião, 2014). These fears were strongly associated with self-criticism as well as depression which suggests that targeting only self-criticism may be a barrier to the acceptance of care and positive, affiliative relationships necessary for therapeutic change. Joeng and Turner (2015) demonstrated that fear of self-compassion (although not fear of compassion from others), self-compassion, and a perception of being important to others mediated the relationship between self-criticism and depression.



Fear of self-compassion and of receiving compassion from others was shown to mediate the effect of early shame-based memories and those of safeness and warmth on anxiety and depression (Matos, Duarte & Pinto-Gouveia, 2017). In their model, the best predictor of difficulties with anxiety and depression was fear of self-compassion. Hermanto et al. (2016) showed that fear of compassion from others moderated the relationship between self-criticism and depression, with higher rates of fear of compassion resulting in an increased depressogenic effect.

In the field of eating disorders, Kelly, Carter, Zuroff and Borairi (2013) examined the relationship between shame, self-compassion, and fear of self-compassion and their effect over time on eating disordered behaviour. In the context of receiving inpatient or day hospital treatment, they found that people low in self-compassion and high in fear of self-compassion demonstrated limited reduction in eating disordered behaviour. These results suggest that it is not simply low capacity for self-compassion that inhibits clinical improvement and that fear of compassion may play a role.

Fear of compassion was shown to be a stronger predictor of eating disorder symptomatology than self-compassion (Kelly, Vimalakanthan & Carter, 2014). In Ferreira, Pinto-Gouveia and Duarte's (2013) study, higher levels of self-compassion were linked to reduced body image dissatisfaction and less disordered eating behaviours. The clinical implications of an inability to engage in self-compassion included increased shame, general distress, and eating disorder symptoms. The important protective capacity of self-compassion was demonstrated through its mediating effect on the relationship between shame and drive for thinness. Self-compassion also partially mediated the relationship between body dissatisfaction and drive for thinness, thus reiterating its importance for therapeutic progress and the need to address any existing types of fear of compassion hence the argument for conducting the proposed study.

In summary, the evidence points to a relationship between self-criticism and eating disordered behaviour. Research in other areas highlights the necessity of addressing the influence of different types of fear of compassion alongside targeting self-criticism for improved treatment outcomes. From a clinical perspective, the proposed study could inform treatment pathways wherein, for example, clients high in fear of compassion are supported to overcome this issue prior to addressing self-criticism during therapy. The proposed study therefore seeks to examine the impact of all three types of fear of compassion on the relationship between self-criticism and eating disordered behaviour.

## 2 RESEARCH QUESTION

Does fear of compassion mediate the relationship between self-criticism and eating disorder symptomatology?

## 3 STUDY DESIGN AND METHODS OF DATA COLLECTION AND ANALYSIS

### 3.1 Design

This is a quantitative cross-sectional research study using online survey method in order to recruit one large group of adults with or without difficulties in their relationship with food and/or eating.

### 3.2 Data collection

An online survey has been developed using Qualtrics (see [https://lancasteruni.eu.qualtrics.com/jfe/form/SV\\_9S6Kkmy2gXSaStT](https://lancasteruni.eu.qualtrics.com/jfe/form/SV_9S6Kkmy2gXSaStT)) to collect the following data:

- Demographics (collected in order to produce descriptive statistics on the data and compare groups):
  - gender, age, ethnicity, employment status, marital status
- Standardised measures (see below for rationale):
  - 10-item ‘Self-critical rumination scale’ (SCRS; Smart, Peters & Baer, 2016)
    - Cronbach’s alpha = .92
  - 22-item ‘Forms of self-criticism and self-reassurance scale’ (FSCRS; Gilbert, Clark, Hempel, Miles & Irons, 2004)
    - Cronbach’s alpha ‘inadequate self’ subscale = .90
    - Cronbach’s alpha ‘hated self’ subscale = .86
    - Cronbach’s alpha ‘reassured self’ subscale = .86
  - 38-item ‘Fears of compassion scale’ (FOCS; Gilbert, McEwan, Matos & Ravis, 2011)
    - Cronbach’s alpha ‘fear of compassion for self’ subscale = .85
    - Cronbach’s alpha ‘fear of compassion from others’ subscale = .87
    - Cronbach’s alpha ‘fear of compassion for others’ subscale = .78
  - 28-item ‘Eating Disorder Examination Questionnaire’ (EDE-Q; Fairburn & Beglin, 1994)
    - Cronbach’s alpha global score = .94
    - Cronbach’s alpha subscales = .75–.90
  - 7-item depression subscale from the 21-item ‘Depression, Anxiety and Stress Scale’ (DASS-21; Lovibond & Lovibond, 1995a)
    - Cronbach’s alpha global score = .91

A second, unlinked survey will be used to collect email addresses and store this data separately for the prize draw [https://lancasteruni.eu.qualtrics.com/jfe/form/SV\\_aWfWwd8r1SHrIhv](https://lancasteruni.eu.qualtrics.com/jfe/form/SV_aWfWwd8r1SHrIhv)

The measures of self-criticism were chosen based upon a recent systematic review of tools developed to measure self-criticism (Rose & Rimes, 2018). The outcome of the review was that the SCRS focused on repeated self-critical thinking and was recommended for research use due to consistently high ratings in terms of reliability and validity. The FSCRS was also recommended by the review for similar purposes and differs from the SCRS in that it was developed for assessing self-criticism specifically in response to a perceived negative event. Both the SCRS and the FSCRS have been used previously in other research (e.g. Gilbert, Durrant & McEwan, 2006; Hermanto et al., 2016; Moreira & Canavarro, 2018; Pinto-Gouveia, Castilho, Matos & Xavier, 2013; Rose, McIntyre & Rimes, 2018). The FOCS is the only scale available that measures fear of compassion and it has also been used extensively in other research (e.g. Hermanto et al., 2016; Joeng & Turner, 2015; Kelly, Carter, Zuroff & Borairi, 2013). The EDE-Q is used widely in both clinical and research contexts as a well-validated tool for measuring eating disorder symptomatology. The DASS-21 is a freely available tool that has been validated in both clinical and non-clinical populations (Henry & Crawford, 2005; Page, Hooke, & Morrison, 2007) and is used widely in research. The depression subscale from the DASS-21 was chosen to allow comparison in the current study with previous research exploring the relationships between depression, fear of compassion, and self-criticism (e.g. Gilbert, McEwan, Matos & Rivas, 2011; Gilbert, McEwan, Caterino, Baião, & Palmeira, 2014). The rationale for using the depression subscale only was to limit participant burden in completing the online survey. A study published by Lovibond and Lovibond (1995b) suggests that, psychometrically, the depression subscale compares well to other depression measures (e.g. Beck Depression Inventory; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

- Additional eating disorder specific questions:
  - Have you ever been given an eating disorder diagnosis? If so, which?
  - Do you identify with any of the eating disorder diagnoses? If so, which?
  - Have you ever been hospitalised as a result of an eating disorder?

These questions were included in order to be able to examine between-group differences e.g. how scores for those diagnosed with or who identify with anorexia nervosa differ from those with bulimia nervosa etc. The question re hospitalisation serves as another indicator of severity and data of this type is routinely collected within eating disorders research.

## **4 SAMPLE AND RECRUITMENT**

### **4.1 Eligibility criteria**

Participants eligible for the study will include English-speaking adults (aged 18 or over) not limited by gender who are able to complete an online survey. Participants must be based in the United Kingdom.

#### **4.1.1 Inclusion criteria**

- Aged 18 or over
- Any gender

- Reside in the UK
- Able to provide informed consent
- Able to access and complete the online survey

#### **4.1.2 Exclusion criteria**

- Non-English speakers

## **4.2 Sampling**

For a mediation analysis Fritz and MacKinnon (2007) suggest a sample size of 71 based on medium effect sizes for both arms using a bias-corrected bootstrap method. The study will therefore seek to recruit a minimum of 71 participants from clinical and non-clinical settings in order to gain a wide distribution of scores on the eating disorder scale.

Participants will be recruited via purposive, convenience sampling in that study information will be made available online in arenas relevant to the research question. Data collection will end if a maximum of 300 participants are recruited.

## **4.3 Recruitment**

### **4.3.1 Sample identification**

In order to gain a wide variety of participants this study will aim to recruit from several sources including:

- The national eating disorder charity 'Beat'. Beat is ideally placed to enable the identification of a pool of potentially suitable participants who have experienced difficulties within their relationship with food and eating, many of whom may also have received an eating disorder diagnosis. They have agreed to promote the study on their research page <https://www.beateatingdisorders.org.uk/eating-disorders-research> and via social media (e.g. Twitter). Promotion via Beat's website and social media platforms will extend opportunities for participation to a wider geographical area including people across the UK. Beat are actively involved in research as part of their agenda and have a dedicated section on their website for the promotion of research.
- The Compassionate Mind Foundation have also been approached in the same regard and asked to include the study on their research register (to be confirmed).
- The study advert will also be shared with various professional, clinical, and academic agencies who have a presence on Twitter in relation to research on eating disorders and compassion e.g. the 'Eating Behaviours and Disorders Research Group' at the University of Edinburgh, 'FREED from ED', 'King's College ED Research', 'British Eating Disorders Society'

- A local non-NHS eating disorder service ('S.E.E.D.') <http://www.seedeatingdisorders.org.uk/>
- People from non-clinical populations including the community and staff/students at Lancaster University. Lancaster University have agreed to advertise the study to on their research webpage (<https://www.lancaster.ac.uk/research/participate-in-research/>) as well as to students on the 'Psychology Research Participation System'.

As above, the study will be promoted online (using the electronic study advertisement – see Appendix A) including on social media sites (e.g. Facebook, Twitter, Workplace) and the websites of promoting organisations including Beat. Posts from social media that are shared by Beat and other agencies will be re-shared via the Principal Investigator's dedicated study Twitter account in order to increase likelihood of uptake.

#### **4.3.2 Prize draw**

In order to aid recruitment, participants will be given the opportunity to enter a prize draw to win one of four £50 Amazon vouchers. Those participants opting into the prize draw will be redirected within the primary survey to a secondary survey requesting their email address and an indication whether the participant wants to opt-in to the prize draw. The data collected in this secondary survey will not be linked to the primary anonymised survey. This is made clear to participants within both surveys. In order to choose a winner, each entrant will be allocated a unique identifier ranging from '1' up to the total number of entrants. A random number generator drawing from the same range of numbers will then be used to determine the winner. The Principal Investigator will forward an electronic £50 Amazon voucher to the winning participant via email in order to avoid requiring any further personal information e.g. name/address.

#### **4.3.3 Consent**

As the study will be promoted online via social network platforms such as Twitter and Facebook, the initial information that will be visible to potential participants will be contained in an 'Online study advertisement' (see Appendix A). This information will include a link for potential participants to begin the online survey which will be prefaced with an embedded electronic Participant Information Sheet and Consent Form.

Participants will be shown the Participant Information Sheet on the first page of the survey along with text explaining the importance of reading through the information in full. The contact details of the principal investigator are provided for participants who may wish to make contact to ask questions prior to taking part. The second page of the survey contains the Consent Form featuring five statements in response to which the participant must indicate that they agree by checking a box stating 'I consent to all five statements above and wish to take part in the study'. Only by clicking on this option will the rest of the survey be shown. If the participant selects the option to indicate that they do not agree/consent, the survey will end and this is made clear on the page. Participants will not be able to withdraw any data entered up until the point they leave the survey and this will also be clear on the Participant Information Sheet and Consent Form.

#### **4.3.4 Data analysis**

Data will be analysed using linear multiple regression to test a theoretical mediational model using Hayes (2018) PROCESS tool within SPSS. It is hypothesised that the relationship between ‘self-criticism’ (X) and eating disorder symptomatology (Y) will be mediated by ‘fear of compassion’ (M). T-tests will also be performed to compare difference between groups e.g. self-reported diagnosis, gender, those who score above and below the clinical cut-off score on the eating disorder measure etc.

## **5 ETHICAL AND REGULATORY CONSIDERATIONS**

In order for recruitment for this study to commence, a favourable opinion from the FHMREC must be obtained and documented. None of the agencies that will be involved in promotion of the study (e.g. Beat and the Compassionate Mind Foundation) have a separate ethical approval process, however they have provided in writing (via email) their agreement in principle to support and promote the study when a favourable opinion from the FHMREC is received.

### **5.1 Assessment and management of risk**

#### **5.1.1 Risk of emotional distress**

The questions within the survey are seeking information about participants’ attitudes in terms of compassion and self-criticism; they also elicit responses in relation to eating disordered behaviour. As a result there is a risk that any of these aspects of the survey could cause emotional distress through prompting self-reflection. It may be difficult for some people to contemplate or bring things into awareness that had not previously been considered.

More specifically, the survey contains questions (in relation to eating, shape, weight, appearance etc.) that are potentially triggering for people who are experiencing difficulties in relation to their eating behaviour. In order to mitigate this risk, the presence of these types of questions is made clear in the Participant Information Sheet at the start, prior to the participant providing consent, and it is clear that such questions are optional. In addition, within the body of the survey, any potentially triggering questions are immediately preceded by warnings.

The study aims to recruit people from both clinical and non-clinical populations. Particularly for those from a non-clinical population, there may also be an additional risk of an individual becoming concerned about their eating behaviours and/or other aspects of their mental health.

In order to address the potential risks detailed above, the survey is explicit that the questionnaires are not diagnostic. A statement regarding what to do if you are concerned about your own or someone’s else eating behaviour or mental health and a list of contact details for accessing support is displayed whenever a participant ends the survey, whether or not they complete all of the questions and proceed to the end.

### **5.1.2 Risk of harm to self or others including safeguarding and criminal activity**

Given the limited direct contact that the Principal Investigator will have with participants, there is a low probability of the Principal Investigator becoming aware of risks to participants or others. This includes participant disclosures of thoughts or intentions to harm or kill themselves or others, or information related to the safeguarding of children and vulnerable adults. Should these instances occur, the Principal Investigator will respond according to the assessed level of risk as based upon the information available at that time. Emergency services may be required in the event of risk of immediate and serious harm to self or others or risk of serious criminal activity (such as a disclosure related to extremist activity). In the event of risk assessed as non-immediate or low to medium risk, further support and advice may be sought by the Principal Investigator from the Field Supervisor and/or Research Supervisor as well as other agencies (e.g. the Police, children's social care) and the participant may be referred to other agencies, particularly those support agencies detailed within the online survey.

### **5.1.3 Risk to Principal Investigator**

#### **5.1.3.1 Risk of emotional distress**

There is a low risk to the researcher for this project due to its online, anonymised and quantitative nature. The main risk identified would be that of the researcher being distressed in response to a participant experiencing difficulties related to their participation (e.g. study triggers distress) and who as a result makes contact in order to seek help. In this instance, the researcher will signpost the participant to relevant support and seek supervision from the field supervisor for personal support if required.

## **5.2 Patient and public involvement**

Three 'experts by experience' (EbE) linked to the charity Beat were consulted in the design of the research i.e. they viewed all of the study material (participant information sheet, consent form, online survey) and piloted the survey using dummy data which was not retained. They gave qualitative feedback based on the following questions:

1. How do you feel about the title of the study?
2. What was your overall experience of the survey? (i.e. takes too long, information not clear enough, too much information etc.)
3. Are there any parts that you find unacceptable for any reason? Perhaps too distressing, dislike of language etc.
4. Do the participant information and consent sections (at the start) seem OK?
5. Do you find the language used acceptable?
6. Any other comments

The EbE were consulted regarding the title of the project which resulted in a choice of the words 'eating disordered behaviour' over other options. A member of staff with significant experience of reviewing eating disorder research studies at Beat also provided general feedback on all study materials.

### **5.3 Data protection and patient confidentiality**

The Principal Investigator, Research Supervisor, Field Supervisor and other members of the administration team must all comply with the General Data Protection Regulation (GDPR) and the (UK) Data Protection Act 2018) with regards to the collection, storage, processing and disclosure of personal information and will uphold their core principles. All study data will be collected, securely stored and maintained in accordance with legislative frameworks governing data protection, research ethics and research governance.

For the purposes of conducting the study it will not generally be necessary to record participants' personal identifiable information such as name, telephone number and/or email address. Two exceptions to this are: a.) when a participant has chosen to opt-in to the £50 Amazon voucher prize draw, and b.) when a participant has chosen to opt-in to receive a summary of overall study results. In both of these instances, the participant will be asked to send an email to the Principal Investigator's university email address. The Principal Investigator will not be able to link the email addresses from such correspondence to any data collected as part of the study. After the prize draw is completed the Principal Investigator will permanently delete any records pertaining to such email correspondence. The same process will be followed in relation to circulation of summaries of study results. The Principal Investigator will forward an electronic £50 Amazon voucher to the winning participant via email in order to avoid requiring any further personal information e.g. name/address. Survey data collected will be stored within Qualtrics and then transferred directly onto Lancaster University's secure server.

### **5.4 Access to final study dataset**

The Principal Investigator, Research Supervisor and Field Supervisor will have access to survey data for analysis and supervision purposes.

Members of the DCLinPsy research and programme administration team (e.g. the Research Coordinator) will also need to access study data for data storage purposes under the direction of the Research Supervisor. The Programme will securely store data electronically for a period of 10 years in accordance with their data retention policy. It is anticipated that data storage for this study will not exceed 50GB. A copy of data will also be deposited in Lancaster University's institutional data repository PURE for the same period of time and made available to other researchers on request. Any data that carries a risk of a participant being identified within their population as a result of particular characteristics will be withheld.

## **6 DISSEMINATION POLICY**

### **6.1 Dissemination policy**



On completion of the study, data will be analysed and a report will be compiled by the Principal Investigator for submission to the Doctorate in Clinical Psychology programme for examination. It is hoped that should the data be sufficient, a separate report will also be prepared for journal publication purposes. Agencies involved in the promotion of the study (e.g. Beat, Compassionate Mind Foundation) will be offered a copy of the full study report as well as a brief summary. Participants will be given an opportunity to opt-in to receiving results via email and will receive the same.

A departmental presentation on the results of the study will be made to colleagues on the DClInPsy programme at Lancaster University and results may be used for similar purposes e.g. conferences.

## 7 PROTOCOL REFERENCES

- Beck, A.T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961) An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-571.
- Campos, R.C., Besser, A., & Blatt, S.J. (2010). The mediating role of self-criticism and dependency in the association between perceptions of maternal caring and depressive symptoms. *Depression & Anxiety*, 27(12), 1149-1157. doi:10.1002/da.20763.
- Dunckley, D.M., Sanislow, C.A., Grilo, C.M. & McGlashan, T.H. (2009). Self-criticism versus neuroticism in predicting depression and psychosocial impairment for 4 years in a clinical sample. *Comprehensive Psychiatry*, 50(4), 335-346. doi:10.1016/j.comppsy.2008.09.004.
- Fairburn, C.G. & Beglin, S.J. (1994). Assessment of eating disorder psychopathology: interview or self-report questionnaire? *International Journal of Eating Disorders*, 16, 363-370.
- Fennig, S., Hadas, A., Itzhaky, L., Roe, D., Apter, A., & Shahar, G. (2008). Self-Criticism is a Key Predictor of Eating Disorder Dimensions among Inpatient Adolescent Females. *International Journal of Eating Disorders*, 41(8), 762-765. doi:10.1002/eat.20573
- Ferreira, C., Pinto-Gouveia, J., & Duarte, C. (2013). Self-compassion in the face of shame and body image dissatisfaction: implications for eating disorders. *Eating Behaviours*, 14(2), 207-210. doi:10.1016/j.eatbeh.2013.01.005
- Fritz, M.S. & MacKannon, D.P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233-239.
- Gilbert, P., Clark, M., Hempel, S., Miles, J.N.V. & Irons, C. (2004). Criticising and reassuring oneself: An exploration of forms, styles and reasons in female students. *British Journal of Clinical Psychology*, 43, 31-50. doi:10.1348/014466504772812959.
- Gilbert, P., Durrant, R. & McEwan, K. (2006). Investigating relationships between perfectionism, forms and functions of self-criticism, and sensitivity to put-down. *Personality and Individual Differences*, 41(7), doi:10.1016/j.paid.2006.05.004.
- Gilbert, P. (2009). *The compassionate mind*. London, UK: Constable & Robinson Ltd.
- Gilbert, P. (2010). *Compassion focused therapy: Distinctive features*. London, UK: Routledge.
- Gilbert, P., McEwan, K., Catarino, F., Baião, R., & Palmeira, L. (2014). Fears of happiness and compassion in relationship with depression, alexithymia, and attachment security in a depressed sample. *British Journal of Clinical Psychology*, 53(2), 228-244. doi:10.1111/bjc.12037
- Gilbert, P., McEwan, K., Matos, M. & Rivas, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research and Practice*, 84, 239-255. Doi:10.1348/147608310X526511.
- Goss, K. & Allan, S. (2014). The development and application of compassion-focused therapy for eating disorders (CFT-E). *British Journal of Clinical Psychology*, 53(1), 62-77. Doi:10.1111/bjc.12039.
- Hayes, A.F. (2018). *Introduction to mediation, moderation and conditional process analysis: a regression-based approach* (2nd ed.). New York, NY, US: Guilford Press.

- Henry, J. D., & Crawford, J. R. (2005). The 21-item version of the Depression Anxiety Stress Scales (DASS–21): Normative data and psychometric evaluation in a large non-clinical sample. *British Journal of Clinical Psychology, 44*, 227–239.
- Hermanto, N., Zuroff, D.C., Kopala-Sibley, D.C., Kelly, A.C., Matos, M., Gilbert, P., & Koestner, R. (2016). Ability to receive compassion from others buffers the depressogenic effect of self-criticism: A cross-cultural multi-study analysis. *Personality and Individual Differences, 98*, 324-332. Doi:10.1016/j.paid.2016.04.055
- Joeng, J.R. & Turner, S.L. (2015). Mediators between self-criticism and depression: fear of compassion, self-compassion, and importance to others. *Journal of Counselling Psychology, 62*(3), 453-463. Doi:10.1037/cou0000071
- Kannan, D. & Levitt, H.M. (2013). A review of client self-criticism in psychotherapy. *Journal of Psychotherapy Integration, 23*(2), 166-178. Doi:10.1037/a0032355
- Kelly, A.C., Carter, J.C., Zuroff, D.C., & Borairi, S. (2013). Self-compassion and fear of self-compassion interact to predict response to eating disorders treatment: A preliminary investigation. *Psychotherapy Research, 23*(3), 252-264. Doi:10.1080/10503307.2012.717310.
- Kelly, A.C., Vimalakanthan, K., & Carter, J.C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: an examination of female students and eating disorder patients. *Eating Behaviours, 15*(3), 388-391. doi:10.1016/j.eatbeh.2014.04.008
- Leaviss, J & Uttley, L. (2015). Psychotherapeutic benefits of compassion-focused therapy: an early systematic review. *Psychological Medicine, 45*(5), 927-945. doi:10.1017/S0033291714002141.
- Longe, O., Maratos, F.A., Gilbert, P., Evans, G., Volker, F., Rockliff, H. & Rippon, G. (2010). Having a word with yourself: neural correlates of self-criticism and self-reassurance. *Neuroimage, 49*(2), 1849-1856. doi:10.1016/j.neuroimage.2009.09.019.
- Lovibond, S.H. & Lovibond, P.F. (1995a). *Manual for the Depression Anxiety Stress Scales*. (2nd. Ed.) Sydney: Psychology Foundation.
- Lovibond, P.F. & Lovibond, S.H. (1995b). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*, 335-343.
- MacBeth, A. & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review, 32*(6), 545-552. doi:10.1016/j.cpr.2012.06.003.
- Matos, M., Duarte, J., & Pinto-Gouveia, J. (2017) The Origins of Fears of Compassion: Shame and Lack of Safeness Memories, Fears of Compassion and Psychopathology. *The Journal of Psychology, 151*(8), 804-819. doi:10.1080/00223980.2017.1393380
- Moreira, H. & Canavarro, M.C. (2018). The Association Between Self-Critical Rumination and Parenting Stress: The Mediating Role of Mindful Parenting. *Journal of Child and Family Studies, 27*(7), 2265–2275. Doi:10.1007/s10826-018-1072-x.
- Neff, K.D. (2003). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self Identity, 2*(2), 85-101. Doi:10.1080/15298860390129863
- Neff, K. D., & Costigan, A. P. (2014). Self-Compassion, Well-Being, and Happiness. *Psychologie in Österreich, 2*, 114-119.

- Page, A.C. Hooke, G.R.; & Morrison, D.L. (2007). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in depressed clinical samples. *British Journal of Clinical Psychology*, *46*, 283-297.
- Pinto-Gouveia, J., Castilho, P., Matos, M. & Xavier, A. (2013). Centrality of Shame Memories and Psychopathology: The Mediator Effect of Self-Criticism. *Clinical Psychology Science and Practice*, *20*(3), 323-334. <https://doi.org/10.1111/cpsp.12044>
- Smart, L.M., Peters, J.R., & Baer, R. (2016). Development and Validation of a Measure of Self-Critical Rumination. *Assessment*, *23*(3), 321-332. doi:10.1177/1073191115573300
- Rose, A. & Rimes, K.A. (2018). Self-criticism self-report measures: Systematic review. *Psychology and Psychotherapy* [online version prior to publication]. Retrieved from: <https://doi.org/10.1111/papt.12171>
- Rose, A., McIntyre, R. & Rimes, K.A. (2018). Compassion-Focused Intervention for Highly Self-Critical Individuals: Pilot Study. *Behavioural and Cognitive Psychotherapy*, *46*(5), 583-600. <https://doi.org/10.1017/S135246581800036X>
- Warren, R, Smeets, E., & Neff, K. (2016). Self-Criticism and Self-Compassion: Risk and Resilience: Being Compassionate to Oneself Is Associated with Emotional Resilience and Psychological Well-Being. *Current Psychiatry*, *15*(12), 19-33.

## 3. Ethical approval letter



Applicant: Katy Hughes  
Supervisor: Fiona Eccles  
Department: Health Research  
FHMREC Reference: FHMREC18049

01 March 2019

Dear Katy

**Re: The effect of fear of compassion on self-criticism and eating disordered behaviour**

Thank you for submitting your research ethics application for the above project for review by the **Faculty of Health and Medicine Research Ethics Committee (FHMREC)**. The application was recommended for approval by FHMREC, and on behalf of the Chair of the Committee, I can confirm that approval has been granted for this research project.

As principal investigator your responsibilities include:

- ensuring that (where applicable) all the necessary legal and regulatory requirements in order to conduct the research are met, and the necessary licenses and approvals have been obtained;
- reporting any ethics-related issues that occur during the course of the research or arising from the research to the Research Ethics Officer at the email address below (e.g. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress);
- submitting details of proposed substantive amendments to the protocol to the Research Ethics Officer for approval.

Please contact me if you have any queries or require further information.

Tel:- 01542 593987

Email:- [fhmresearchsupport@lancaster.ac.uk](mailto:fhmresearchsupport@lancaster.ac.uk)

Yours sincerely,

A handwritten signature in black ink that reads "R.E. Case".

Becky Case  
Research Ethics Officer, Secretary to FHMREC.

#### 4. Online survey for main study data collection

### Participant information



### The effect of fear of compassion on self-criticism and eating disordered behaviour

#### Participant Information Sheet

You are being invited to take part in my research study. It involves completing an online survey that should take no longer than 20 minutes to complete. Please read the information below about the study before deciding to participate. It is important for you to understand why this research is being undertaken and what taking part will involve. Feel free to talk to others about the study or contact me on [k.hughes4@lancaster.ac.uk](mailto:k.hughes4@lancaster.ac.uk) if you would like to ask any questions.

My name is Katy Hughes and I am conducting this research as a Trainee Clinical Psychologist as part of the Doctorate in Clinical Psychology programme at Lancaster University, Lancaster, United Kingdom.

#### Who can take part?

Anyone with or without difficulties in their relationship with eating who is aged 18+ and living in the UK can complete this online survey and take part. If you decide to take part after reading this information, you will be able to provide your consent electronically on the next page.

**What is the study about?**

Compassion may be defined as 'a sensitivity to suffering in yourself or others with a commitment to try to alleviate or prevent it'. Self-criticism may be defined as 'how you evaluate yourself in comparison to how you would ideally like to be or your sense of how others judge you'. When people experience difficulties in their relationship with eating that become problematic, this is sometimes referred to as an 'eating disorder' or 'eating disordered behaviour'.

Within this context there is evidence that people who experience higher levels of self-criticism also experience more significant difficulties in their relationship with food. Some psychological interventions aim to help people to be more compassionate towards themselves as a way of reducing self-criticism. However for some people, showing compassion to oneself or others, or indeed receiving it from others can bring about avoidance or even fear reactions.

This study therefore aims to better understand the relationship between fear of compassion and self-criticism and how they affect eating disordered behaviour. It is hoped that results will inform psychological approaches to helping people who experience these types of difficulties.

**Do I have to take part?**

No. It is completely up to you to decide whether or not you take part. After reading this information you are encouraged to spend some time considering whether or not you would like to take part. If you would like to ask any questions, please email me at [k.hughes4@lancaster.ac.uk](mailto:k.hughes4@lancaster.ac.uk)

Sometimes people want to ask questions about the study before they decide. Other times people decide that they do not want to take part. Both of these options are completely fine and it will not affect your rights or access to services in any way. If you decide that you do want to take part but then later you change your mind, you can do that simply by closing the survey window. However, any data collected up until the point you exit the survey may be included in overall study results as the data collected will be anonymous and so it will not be possible for me to identify and remove your data after you exit the survey.

**What will I be asked to do if I take part?**

If you decide you would like to take part in the study, you will be asked to give your consent electronically on the next page, after which the online survey will begin.



The survey will ask for some basic information about you but it will NOT ask for any personal identifiable information such as name, address, or date of birth. You will then be asked to complete five questionnaires. The first relates to fear of compassion, the second and third to self-criticism, the fourth relates to low mood or depression, and the last relates to difficulties in your relationship with food. Many of the questions have an option of 'prefer not to say'. The survey will prompt you to return to any questions that you miss out in case you missed them accidentally. However **it is completely fine to skip any questions with which you do not feel comfortable.**

### **Will my data be identifiable?**

The survey will not ask for any personal identifiable information (e.g. name, address, or date of birth). The information collected via the survey will therefore be completely anonymous. There is an option to be entered into a prize draw for a chance to win one of four £50 Amazon vouchers. In order to enter the prize draw you will be required to input your email address at the very end of the survey. Email addresses are collected and stored securely and separately to any information you enter as part of the main survey and so cannot be linked to your survey responses.

If you email me at [k.hughes4@lancaster.ac.uk](mailto:k.hughes4@lancaster.ac.uk) in order to ask questions about the study, it will NOT be possible for me to link your details (such a name and/or email address) to any survey responses you may provide. This is a University email address. Any email correspondence will be confidential and emails will be securely stored until no longer needed (i.e. once you receive a satisfactory response to any queries about the study), after which they will be permanently deleted.

The data collected for this study will be stored securely on Lancaster University's server. All data is completely anonymous. Lancaster University will securely store data electronically for a period of 10 years in accordance with their data retention policy. It is anticipated that data storage for this study will not exceed 50GB. A copy of data will also be deposited in Lancaster University's institutional data repository 'PURE' for the same period of time and made available to other researchers on request. Any data that carries a risk of a participant being identified within their population as a result of particular characteristics will be withheld.

For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage:

[www.lancaster.ac.uk/research/data-protection](http://www.lancaster.ac.uk/research/data-protection)



**What will happen to the results?**

The results will be analysed, summarised, reported, and submitted as part of my training on the Doctorate in Clinical Psychology programme at Lancaster University. Results may also be submitted for publication in an academic or professional journal and used for conferences or presentations. I will also share my results with the eating disorder charity 'Beat' and the 'Compassionate Mind Foundation' who agreed to help me to advertise this study.

If, after taking part, you wish to receive a summary of the overall study results, there will be an opportunity to indicate this at the end of the survey.

**Are there any risks?**

There is a risk of experiencing distress when participating in this study as you will be asked questions that could be triggering for some people. **At the very end of the survey there is a question about height and weight. Please note that providing this information is completely optional.** Should you experience any distress following participation please seek support using the resources listed at the end of the survey. You may also wish to speak to your GP or care co-ordinator.

**Are there any benefits to taking part?**

Although you may find participation interesting, there are no direct benefits for you although some people derive satisfaction from the potential for research to help others in future.

There is an opportunity to enter a prize draw to win one of four £50 Amazon vouchers. Instructions for entering the prize draw will feature at the end of the survey.

**Who has reviewed the project?**

This study has been reviewed and approved by the Faculty of Health and Medicine Research Ethics Committee at Lancaster University (reference FHMREC18049).

**Where can I obtain further information about the study if I need it?**

If you have any questions about the study, please contact me.

Katy Hughes, Trainee Clinical Psychologist

Email: [k.hughes4@lancaster.ac.uk](mailto:k.hughes4@lancaster.ac.uk)

Doctorate in Clinical Psychology  
Faculty of Health and Medicine  
Division of Health Research  
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Or alternatively, if you would prefer to speak to someone other than me, please contact:

Dr Fiona Eccles, Research Supervisor  
Phone: 01524 592807  
Email: [f.eccles@lancaster.ac.uk](mailto:f.eccles@lancaster.ac.uk)  
Doctorate in Clinical Psychology  
Faculty of Health and Medicine  
Division of Health Research  
Lancaster University  
Lancaster  
LA1 4YG

If you wish to speak to someone outside of the Doctorate in Clinical Psychology programme, you may also contact:

Professor Roger Pickup, Associate Dean for Research  
Pone: Tel: 01524 593746  
Email: [r.pickup@lancaster.ac.uk](mailto:r.pickup@lancaster.ac.uk)  
Faculty of Health and Medicine  
Division of Biomedical and Life Sciences  
Lancaster University  
Lancaster  
LA1 4YG

**Resources in the event of distress**

Below I have included some resources in the event that you feel some additional support would be helpful. You may also speak to your GP/care co-ordinator if you prefer.

Beat – The UK's Eating Disorder charity

[www.beateatingdisorders.org.uk](http://www.beateatingdisorders.org.uk)

Telephone: 0808 801 0677

The Samaritans – 24 hour confidential support to talk through any problems

[www.samaritans.org](http://www.samaritans.org)

Telephone: 116 123

Mind – Information and support for anyone affected by mental health issues

[www.mind.org.uk](http://www.mind.org.uk)

Telephone: 0300 123 3393

## Consent



### The effect of fear of compassion on self-criticism and eating disordered behaviour

#### Consent Form

I am asking if you would like to take part in a research study to help us to understand more about the effect of fear of compassion on self-criticism and eating disordered behaviour.

Before you consent to participating in the study please read the 'Participant Information' section on the previous page. If you would still like to participate, please check that you agree with each of the corresponding statements below before selecting the appropriate response at the bottom of this page.

1. I confirm that I have read the Participant Information Sheet on the previous page and fully understand what is expected of me within this study including the risks and benefits of taking part
2. I confirm that I am aged 18 years or older and living in the UK

3. I understand that participation in this study is anonymous (i.e. I will not be asked for any personal identifiable information)
4. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected (by closing this window). However, any data collected prior to my withdrawal may be used as part of the study as it will not be possible to identify and remove my data.
5. I consent to Lancaster University securely storing the data collected as part of this study for 10 years after the study has finished in line with its data retention policy as detailed in the Participant Information Sheet
6. I consent to take part in the above study

I consent to all six statements above and wish to take part in the study

I do not consent to all six statements above and do not wish to take part in the study (selecting this option will end the survey now)

## Block 9

Thank you for agreeing to take part in this study. The survey will begin on the next page and should take no more than 20 minutes. It will begin by asking some basic questions about you. You will then be asked to complete five brief questionnaires. Please click 'Next page' below to start the survey.

## Demographics

Please note: Each of the questions in this section has a 'prefer not to say' option. Please use this option if for any reason you do not wish to answer a question.

With which gender do you most identify?

Female

Male

Transgender female

Transgender male

Other

Prefer not to say

What is your age? (please enter '0' if you prefer not to say)

How would you describe your occupational status?

Employed full-time	Retired
Employed part-time	Caring for children/others
Not working	Other
Student	Prefer not to say
Self-employed	

How would you describe your partnership status?

Married	Living together but not married
Civil partnership	Single
Divorced	Prefer not to say
Widowed	

How would you describe your ethnicity? (categories from Office of National Statistics)

WHITE - English / Welsh / Northern Irish / Scottish / British

WHITE - Irish

WHITE - Gypsy or Irish Traveller

WHITE - Any other white background

MIXED/MULTIPLE - White and Black Caribbean

MIXED/MULTIPLE - White and Black African

MIXED/MULTIPLE - White and Asian

MIXED/MULTIPLE - Any other mixed/multiple ethnic background

ASIAN/ASIAN BRITISH - Indian

ASIAN/ASIAN BRITISH - Pakistani

ASIAN/ASIAN BRITISH - Bangladeshi

ASIAN/ASIAN BRITISH - Chinese

ASIAN/ASIAN BRITISH - Any other Asian background

BLACK/AFRICAN /CARIBBEAN/BLACK BRITISH - African

BLACK/AFRICAN /CARIBBEAN/BLACK BRITISH - Caribbean

BLACK/AFRICAN /CARIBBEAN/BLACK BRITISH - Any other Black/African/Caribbean background

OTHER ETHNIC GROUP - Arab

OTHER ETHNIC GROUP - Any other ethnic group

Prefer not to say

Have you ever been given an eating disorder diagnosis?

Yes

No

Prefer not to say

Over time, some people are given more than one diagnosis i.e. their diagnosis can change. Which eating disorder diagnosis/diagnoses have you been given? (YOU MAY SELECT MORE THAN ONE)

Anorexia nervosa

Bulimia nervosa

Binge eating disorder

Other eating disorder diagnosis e.g. 'Other specified feeding or eating disorder' or 'Eating disorder not otherwise specified'

Prefer not to say

At what stage of recovery would you say you were in relation to any eating disorder diagnosis you have been given?

In treatment - inpatient

In treatment - outpatient

Not in treatment - recovering/recovered

Other (please specify)

Prefer not to say

Do you currently identify with any eating disorder diagnosis (regardless of whether you have or have not been formally diagnosed)?

Yes

No

Which eating disorder diagnosis do you currently most identify with (regardless if whether you have or have not been formally diagnosed)?

Anorexia

Bulimia

Binge eating disorder

Other (please specify)

Prefer not to say

Have you ever been hospitalised as a result of an eating disorder?

Yes

No

Prefer not to say

### **Fears of Compassion Scale**

**Compassion is defined as 'a sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it'.**

Different people have different views of compassion and kindness. While some people believe that it is important to show compassion and kindness in all situations and contexts, others believe we should be more cautious and can worry about showing it too much to ourselves and to others.

We are interested in your thoughts and beliefs in regard to kindness and compassion in three areas of your life: 1. Expressing compassion for others 2. Responding to compassion from others 3. Expressing kindness and compassion towards yourself.

Below are a series of statements that we would like you to think carefully about and then select the number that best describes how each statement fits you.

### **Expressing compassion for others**



	0 = Don't agree at all	1	2 = Somewhat agree	3	4 = Completely agree
People will take advantage of me if they see me as too compassionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being compassionate towards people who have done bad things is letting them off the hook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are some people in life who don't deserve compassion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that being too compassionate makes people an easy target	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People will take advantage of you if you are too forgiving and compassionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that if I am compassionate, vulnerable people can be drawn to me and drain my emotional resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People need to help themselves rather than waiting for others to help them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I am compassionate, some people will become too dependent upon me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being too compassionate makes people soft and easy to take advantage of	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For some people, I think discipline and proper punishments are more helpful than being compassionate to them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



### Responding to the expression of compassion from others

	0 = Don't agree at all	1	2 = Somewhat agree	3	4 = Completely agree
Wanting others to be kind to oneself is a weakness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that when I need people to be kind and understanding they won't be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm fearful of becoming dependent on the care of others because they might not always be available or willing to give it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often wonder whether displays of warmth and kindness from others are genuine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feelings of kindness from others are somehow frightening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When people are kind and compassionate towards me I feel anxious or embarrassed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If people are friendly and kind I worry they will find out something bad about me that will change their mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that people are only kind and compassionate if they want something from me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When people are kind and compassionate towards me I feel empty and sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If people are kind I feel they are getting too close	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	0 = Don't agree at all	1	2 = Somewhat agree	3	4 = Completely agree
Even though other people are kind to me, I have rarely felt warmth from my relationships with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to keep my distance from others even if I know they are kind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I think someone is being kind and caring towards me, I 'put up a barrier'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Expressing kindness and compassion towards yourself

	0 = Don't agree at all	1	2 = Somewhat agree	3	4 = Completely agree
I feel that I don't deserve to be kind and forgiving to myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I really think about being kind and gentle with myself it makes me sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting on in life is about being tough rather than compassionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would rather not know what being 'kind and compassionate to myself' feels like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I try and feel kind and warm to myself I just feel kind of empty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I start to feel compassion and warmth for myself, I will feel overcome with a sense of loss/grief	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	0 = Don't agree at all	1	2 = Somewhat agree	3	4 = Completely agree
I fear that if I become kinder and less self-critical to myself then my standards will drop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I am more self compassionate I will become a weak person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have never felt compassion for myself, so I would not know where to begin to develop these feelings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that if I start to develop compassion for myself I will become dependent on it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I become too compassionate to myself I will lose my self-criticism and my flaws will show	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I develop compassion for myself, I will become someone I do not want to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I become too compassionate to myself others will reject me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it easier to be critical towards myself rather than compassionate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that if I am too compassionate towards myself, bad things will happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Self-Critical Rumination Scale

For each of the statements below, please rate how well each one describes you by selecting one of the options.

My attention is often focused on aspects of myself that I'm ashamed of

Not at all

A little

Moderately

Very well

I always seem to be rehashing in my mind stupid things that I've said or done

Not at all

A little

Moderately

Very well

Sometimes it is hard for me to shut off critical thoughts about myself

Not at all

A little

Moderately

Very well

I can't stop thinking about how I should have acted differently in certain situations

Not at all

A little

Moderately

Very well

I spend a lot of time thinking about how ashamed I am of some of my personal habits

Not at all

A little

Moderately

Very well

I criticise myself a lot for how I act around other people

Not at all

A little

Moderately

Very well

I wish I spent less time criticising myself

Not at all

A little

Moderately

Very well

I often worry about all of the mistakes I have made

Not at all

A little

Moderately

Very well

I spend a lot of time wishing I were different

Not at all

A little

Moderately

Very well

I often berate myself for not being as productive as I should be

Not at all

A little

Moderately

Very well

## Forms of Self-criticising and Self-reassurance Scale

When things go wrong in our lives or don't work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of themselves.

Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and select the response that best describes how much each statement is true for you.

I am easily disappointed with myself

- Not at all like me
- A little bit like me
- Moderately like me
- Quite a bit like me
- Extremely like me

There is a part of me that puts me down

- Not at all like me
- A little bit like me
- Moderately like me
- Quite a bit like me
- Extremely like me

I am able to remind myself of positive things about myself

- Not at all like me
- A little bit like me
- Moderately like me
- Quite a bit like me
- Extremely like me

I find it difficult to control my anger and frustration at myself

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

I find it easy to forgive myself

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

There is a part of me that feels I am not good enough

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

I feel beaten down by my own self-critical thoughts

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

I still like being me

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**I have become so angry with myself that I want to hurt or injure myself**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I have a sense of disgust with myself**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I can still feel lovable and acceptable**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I stop caring about myself**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I find it easy to like myself**

Not at all like me

A little bit like me

Moderately like me



Quite a bit like me

Extremely like me

**I remember and dwell on my failings**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I call myself names**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I am gentle and supportive with myself**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I can't accept failures and setbacks without feeling inadequate**

Not at all like me

A little bit like me

Moderately like me

Quite a bit like me

Extremely like me

**I think I deserve my self-criticism**

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**I am able to care and look after myself**

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**There is a part of me that wants to get rid of the bits I don't like**

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**I encourage myself for the future**

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**I do not like being me**

Not at all like me  
A little bit like me  
Moderately like me  
Quite a bit like me  
Extremely like me

**Depression scale**

Please read each statement below and indicate how much each statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

1. I couldn't seem to experience any positive feeling at all

Never

Sometimes

Often

Almost always

2. I found it difficult to work up the initiative to do things

Never

Sometimes

Often

Almost always

3. I felt that I had nothing to look forward to

Never

Sometimes

Often

Almost always

4. I felt down-hearted and blue

Never

Sometimes

Often

Almost always

5. I was unable to become enthusiastic about anything

Never  
 Sometimes  
 Often  
 Almost always

6. I felt I wasn't worth much as a person

Never  
 Sometimes  
 Often  
 Almost always

7. I felt that life was meaningless

Never  
 Sometimes  
 Often  
 Almost always

## Block 6

You have now reached the final set of questions. These questions are taken from an eating disorder questionnaire. This is not a diagnostic questionnaire. If you prefer not to answer any one of these questions, please just move onto the next question.

**Please note that these questions specifically relate to issues around eating, shape, and weight and may be triggering for some people. At the very end there are two questions asking for your height and weight. These are also completely optional.**

## Eating Disorder Examination - Questionnaire

On how many of the past 28 days...

0 days    1-5 days    6-12 days    13-15 days    16-22 days    23-27 days    Everyday



	0 days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Everyday
...has thinking about <b>shape or weight</b> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...have you had a definite fear of losing control over eating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...have you had a definite fear that you might gain weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...have you felt fat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...have you had a strong desire to lose weight?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Over the past 28 days, how many **times** have you eaten what other people would regard as an **unusually large amount of food** (given the circumstances)?

In relation to the last question, on how many times did you have a sense of having lost control over your eating (at the time that you were eating)?

Over the past 28 days, on how many **days** have such episodes of over-eating occurred (i.e. you have eaten an unusually large amount of food **and** have had a sense of **loss of control** at the time)?

Over the past 28 days, how many **times** have you made yourself sick (vomit) as a means of controlling your shape or weight?

Over the past 28 days, how many **times** have you taken **laxatives** as a means of controlling your shape or weight?

Over the past 28 days, how many **times** have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?

Please note that for these questions the term "**binge eating**" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating

	0 days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Everyday
Over the past 28 days, on how many days have you eaten in secret (i.e. furtively)? <b>Do not count episodes of binge eating</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On what proportion of the times you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? <b>Do not count episodes of binge eating</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Over the past 28 days, how concerned have you been about other people seeing you eat? <b>Do not count episodes of binge eating</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Over the past 28 days....





## Thank you and resources



Thank you for taking the time to participate in this study. Please click on the [blue link](#) below for details about how to enter the prize draw for the chance to win one of four £50 Amazon vouchers and/or how to obtain a summary of study results. In the event that you opt-in to either of these, please note that your email address CANNOT be linked to your survey results; it will remain confidential and it will be permanently deleted following the prize draw. If you do NOT wish to enter either of these, just click the 'Next' button at the bottom and the survey will end.

[https://lancasteruni.eu.qualtrics.com/jfe/form/SV\\_aWfWwd8r1SHrlhv](https://lancasteruni.eu.qualtrics.com/jfe/form/SV_aWfWwd8r1SHrlhv)

### Resources in the event of distress

Below I have included some resources in the event that you feel some additional support would be helpful. You may also speak to your GP/care co-ordinator if you prefer.

Beat – The UK's Eating Disorder charity

[www.beateatingdisorders.org.uk](http://www.beateatingdisorders.org.uk)

Telephone: 0808 801 0677

The Samaritans – 24 hour confidential support to talk through any problems

[www.samaritans.org](http://www.samaritans.org)

Telephone: 116 123

Mind – Information and support for anyone affected by mental health issues

[www.mind.org.uk](http://www.mind.org.uk)

Telephone: 0300 123 3393



## The effect of fear of compassion on self-criticism and eating disordered behaviour

Hi! My name is Katy and I'm a trainee clinical psychologist at Lancaster University. I'm inviting people aged 18 or above who are living in the UK, **with or without experience of difficulties in their relationship with food and eating**, to take part in my research.

I want to find out more about how fear of compassion affects self-criticism and/or people's eating behaviours. My hope is to understand the relationship between these concepts in order to think about how we may be able to improve the help we provide for people who experience difficulties with food and eating.

Taking part should take no more than 20 minutes and involves completing an online survey here:

[https://lancasteruni.eu.qualtrics.com/jfe/form/SV\\_9S6Kkmy2gXSaStT](https://lancasteruni.eu.qualtrics.com/jfe/form/SV_9S6Kkmy2gXSaStT)

As a thank you for taking part, you can choose to be entered into a prize draw for a chance to win one of four £50 Amazon vouchers.

If you would like to ask any questions, please get in touch with me:



Katy Hughes



Email me at [k.hughes4@lancaster.ac.uk](mailto:k.hughes4@lancaster.ac.uk)