

1 RUNNING HEAD: SHAME, GUILT AND EATING DISORDERS

2

3

4 **Experiences of Shame and Guilt in Anorexia and Bulimia Nervosa: A Systematic**
5 **Review**

6

7

8 Suzanne P. M. Blythin¹; suzanneblythin@gmail.com

9 Hannah L. Nicholson²; hannah.i.niko@gmail.com

10 Vanessa Macintyre³; vanessa.macintyre@manchester.ac.uk

11 Joanne M. Dickson^{1,4}; j.dickson@ecu.edu.au

12 John, R. E. Fox⁵; Johnfoxresearch@gmail.com

13 Peter J. Taylor^{3*}; peter.taylor-2@manchester.ac.uk

14

15 ¹ Institute of Psychology, Health and Society, University of Liverpool, England, L69 3GB

16 ² The School of Psychology, University of Central Lancashire, Preston, Lancashire, PR1 2HE

17 ³ Division of Psychology & Mental Health, University of Manchester, England, M13 9PL

18 ⁴ Department of Psychology, School of Arts and Humanities, Edith Cowan University,

19 Australia

20 ⁵ South Wales Clinical Psychology Training Programme, Cardiff University, Wales, CF10

21 3XQ

22

23 * Corresponding author

24 Email: peter.taylor-2@manchester.ac.uk

25 Tel: +44(0)161 3060425

26

27 Word count: 5397

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

Abstract

Objectives: Emotional states may play an important role in the development and maintenance of Anorexia (AN) and Bulimia Nervosa (BN). This systematic review aimed to examine the evidence regarding the relationship that shame and guilt have with two eating disorders, AN and BN. **Methods:** Four major databases (Pubmed, PsychINFO, Web of Science, Medline) were searched (up until April 2018) for studies measuring guilt or shame in clinically diagnosed AN and BN groups. Included papers were evaluated for risk of bias. **Results:** Twenty-four papers met the inclusion criteria. Several methodological issues were noted within the reviewed studies, including a lack of longitudinal data and unaccounted confounding variables. Nonetheless shame was typically more common in those with AN and BN than controls, was positively related to the severity of symptoms, and associated with the onset of eating disorder-related difficulties (e.g. bingeing or purging). Effect sizes were typically moderate to large. The role of guilt was less clear, with few studies and mixed results. **Discussion:** There is preliminary evidence that shame is implicated in the aetiology of AN and BN presentations, whilst there is currently insufficient evidence of such a role for guilt. It remains unclear whether shame is a risk factor for the development of AN and BN or a consequence of these difficulties. **Keywords:** Shame; guilt; bulimia nervosa; anorexia nervosa; eating disorder.

Practitioner Points

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

- Elevated shame appears to be a feature of Anorexia (AN) and Bulimia Nervosa (BN).
- Shame appears to fluctuate with the occurrence of eating disordered behaviours like bingeing, purging or restricted eating.
- Guilt is less consistently linked to AN and BN presentations.
- Interventions directed at shame may be helpful for these populations
- A lack of longitudinal data means the direction of these relationships is still unclear

Experiences of Shame and Guilt in Anorexia and Bulimia Nervosa: A Systematic Review

Eating disorders (EDs) are characterised by disturbed eating behaviours and affect 1.6 million people within the United Kingdom (UK; Beating Eating Disorders, 2012) and 30 million in the United States (Wade, Keski-Rahkonen & Hudson, 2011). EDs have the highest mortality rates of all mental health difficulties (Beating Eating Disorders, 2012; Arcelus et al, 2011). Anorexia nervosa (AN) and Bulimia nervosa (BN) are two common ED presentations. Whilst advances in the provision of psychological interventions for AN and BN have been made, outcomes are variable and many continue to present with difficulties following treatment (Fichter, Quadflieg, Crosby & Koch, 2017; Wilson, Grilo, & Vitousek, 2007). Relapse rates for both AN and BN are reportedly high (Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; Grilo et al., 2012). A comprehensive understanding of the mechanisms underlying and maintaining these presentations is essential to best support and intervene with AN and BN (Cooper, 2012). Cognitive models have dominated contemporary psychological explanations of AN and BN (Waller & Kennerley, 2003). However, emotional states may also play an important role in explaining and predicting the onset and maintenance of AN and BN (Goss & Gilbert, 2002). The current review focuses on the association of two specific emotional states, shame and guilt, with AN and BN.

Shame and guilt demonstrate strong associations with psychological difficulties, including depression, post-traumatic stress disorder, and psychosis (e.g. Andrews, Qian & Valentine, 2002; Kim, Thibodeau, & Jorgensen, 2011; Pugh et al., 2015; Taylor et al., 2015a). Shame is a complex, painful emotion, which involves global self-devaluation and concern for negative evaluations of the self by others (Tangney & Dearing, 2002; Tangney, Stuewig & Mashek, 2007). Guilt is commonly associated with shame (Tangney & Dearing, 2002; Hooge, Zeelenberg & Breugelmans, 2007), but unlike shame, does not impact upon the global sense of self and is instead associated with negative evaluations of specific behaviours

1 and their effect on others (Tangney & Dearing, 2002, Hooge, Zeelenberg & Breugelmans,
2 2007).

3 Whilst shame concerns the way a person sees themselves, a separate tradition has
4 focused on how a person imagines that others see them, sometimes labelled as “external
5 shame” (as opposed to internal shame; Matos, Pinto-Gouveia, Gilbert, Duarte & Figueiredo,
6 2015; Taylor, Pyle, Schwannauer, Hutton & Morrison, 2015a). Notably, this internal/external
7 distinction has not been applied to guilt, though there have been attempts to distinguish
8 adaptive or reasonable guilt from a more pathological, maladaptive guilt (Pugh, Taylor &
9 Berry, 2015). There has also been a distinction in the literature between measures of the
10 actual level of shame or guilt experienced in a particular time period (e.g. Experiences of
11 Shame Scale; Andrews, Qian & Valentine, 2002), and measures of trait-like proneness to
12 experience shame or guilt, usually relying on respondents making judgements regarding
13 hypothetical scenarios (e.g. Test of Self-Conscious Affect-TOSCA; Luyton, Fontaine &
14 Corveleyn 2002).

15 The way in which shame and guilt concern how one is judged or evaluated suggests
16 they may be particularly important in understanding AN and BN, where social interaction and
17 the way one is perceived by others appears critical (Treasure, Corfield & Cardi, 2012). Both
18 emotions have been implicated in the aetiology of EDs but there has been particular emphasis
19 on shame (Burney & Irwin, 2000; Doran & Lewis, 2012). It has been suggested that early
20 adversity may contribute to a sensitivity to shame and that ED behaviours (i.e. attempts to
21 control eating) may represent means of defending against shame, for example by exercising
22 control and signalling status (Goss & Gilbert, 2002; Treasure et al., 2012). Both AN and BN
23 are characterised by attempts to control diet, weight or eating (Stice, Rizvit & Telch, 2000).
24 As shame is an aversive state and drives attempts to hide perceived inferiority from others, it
25 may be that experiences of shame provoke the attempts at control seen in AN and BN and

1 thus contribute to these disorders. In contrast to shame, as guilt only concerns specific
2 behaviours, it is arguably less likely to drive ED behaviours in the same way. Unlike shame,
3 guilt may also be resolved through reparative action regarding a specific behaviour (Tangney
4 & Dearing, 2002). We might therefore hypothesize that shame is more strongly associated
5 with the onset and maintenance of AN and BN than guilt. This would mirror what is seen for
6 depression and PTSD (shame appears more important; Kim, Thibodeau, & Jorgensen, 2011;
7 Pugh et al., 2015).

8 Whilst shame and guilt may be causal factors in the development and maintenance of
9 AN and BN, it is also possible, considering the stigma and taboo that surrounds these
10 disorders, that shame and guilt are consequences of AN and BN (Burney & Irwin, 2000;
11 Oluyori, 2013; Sanftner et al., 1995). Interactions with friends and family concerning ED
12 behaviours may produce feelings of shame or guilt, however, which maintain the problem by
13 triggering further attempts to control or manage weight and appearance as a way of regulating
14 these feelings (Treasure et al., 2008).

15 A recognition of the role of emotion in AN and BN is now evident in cognitive
16 approaches (e.g. Cooper, 2012; Cooper, Wells, & Todd, 2004). If shame or guilt play a
17 substantive role in the development and maintenance of AN and BN then there may be a
18 value to adapting existing interventions such as CBT to better account for the presence of
19 shame or guilt. For example, this may include incorporating treatments developed from
20 compassion focussed approaches, which focus on the role of such emotions (Goss & Allan,
21 2009). There are also implications for broader public health initiatives, looking at ways
22 shame and guilt related to AN and BN might be reduced through altering public perceptions
23 and insights.

24 Oluyori (2013) compiled evidence from five qualitative research papers in a recent
25 systematic review and concluded that shame is implicated in both the onset and maintenance

1 of ED presentations. However, the conclusions did not shed light on the specific role of these
2 emotions within AN and BN. A systematic review of the quantitative evidence-base is timely,
3 enabling a triangulation of results with the qualitative literature. To date no review of this
4 nature has been completed.

5 This review aims to synthesise the extant quantitative literature regarding the
6 association that shame and guilt have with AN and BN clinical presentations and with ED
7 symptoms within these groups. By clinical presentations we refer to those meeting criteria for
8 a diagnosis of these disorders. It was predicted that both shame and guilt will be associated
9 with these presentations, due to the commonalities shared by the emotions (Tangney &
10 Dearing, 2002). However, it is expected that only shame will be independently associated
11 with ED symptoms. Furthermore, it is hypothesised that the role of shame will be more
12 pronounced than that of guilt.

13 Method

14 Search Strategy

15 A literature review was completed to identify quantitative studies which measured
16 experiences of guilt and/or shame, in those with clinical presentations of AN or BN. Four
17 databases were utilised (PubMed.gov; PsycINFO; Medline; Web of Science). Searches were
18 completed from inception to December 2016. The search was then updated to April 2018.
19 The search strategy used the following terms (a) terms related to ED presentations: "*eating*
20 *disorder**" OR *anorexia* OR *bulimia* OR *binge** OR *binge-eating* OR "*eating disorder not*
21 *otherwise specified*" OR *EDNOS*; (b) terms associated with the feelings guilt and shame:
22 *shame** OR *guilt** OR *anger* OR *hostil**. Search terms from each group were combined using
23 the Boolean operator "AND". The terms "anger" and "hostil*" were included to account for
24 the possibility that shame might be labelled as anger or hostility directed towards the self
25 (during screening the researchers checked if such instances could be classified as shame or

1 guilt). Whilst the focus of the review was on AN and BN, search terms related to EDNOS
2 and binge-eating were also included as studies focussing on these groups may still include
3 samples or sub-samples of participants with AN or BN. We did not include terms related to
4 cognitive processes associated with shame and guilt, such as blame, social comparison or
5 self-criticism, as our focus was specifically on emotions. Identified articles were initially
6 screened by title and abstract. The full texts of remaining articles were then read to check
7 eligibility with inclusion criteria. Both stages of screening (titles & abstracts; full text) were
8 completed in parallel by two independent researchers for the original search up till December
9 2016, and discrepancies were resolved via discussion. The follow-up search was screened by
10 single researcher (VM). The reference lists of eligible papers were also hand-searched to
11 identify additional eligible articles. The review protocol was not pre-registered.

12 **Inclusion Criteria**

13 Studies included in the review met the following criteria: (a) were peer-reviewed
14 original research papers; (b) full-text articles available in English; (c) utilised a quantitative
15 methodology; (d) featured a group of individuals with AN and/or BN presentations (defined
16 as having a diagnosis of these disorders, whether self-reported or clinically verified)
17 accounted for $\geq 50\%$ of the **ED** sample; (e) either measured ED relevant symptoms, compared
18 a clinical AN and/or BN sample with a control group, or made AN and BN sub-type
19 comparisons; (f) guilt and/or shame was measured independently (rather than an aggregate
20 scale). We adopted the inclusive approach of including papers with self-reported diagnoses or
21 chart diagnoses (i.e. determined via medical notes or psychiatric service) as opposed to only
22 including studies where diagnoses were independently verified by researchers or clinicians,
23 but then assessed this as part of the risk of bias assessment. We did not include papers that (a)
24 focused on the quality of shame memories (e.g. Matos, Ferreira, Duarte & Pinto-Gouveia,
25 2014) as this is distinct to shame as a currently felt emotion; (b) assessed guilt or shame

1 related schema or cognitive constructs as opposed to emotions; (c) employed experimental
2 manipulations, or (d) focused on evaluating treatments. In the latter two cases this was
3 because the focus here was on the naturally-occurring (not manipulated or modified) link
4 between these emotions and ED. Papers were excluded if they did not meet the inclusion
5 criteria or insufficient information was available to establish eligibility. Authors were
6 contacted in cases where eligibility was uncertain.

7 **Risk of Bias Assessment**

8 The papers were assessed for risk of bias using an adapted version of a risk of bias
9 tool created by Williams, Plassman, Burke, Holsinger, and Benjamin (2010). This tool has
10 previously been adapted and utilised in other reviews including Taylor, Hutton, and Wood
11 (2015b). The tool assesses risk of bias across multiple domains including the
12 representativeness and description of the cohort; the methods utilised to ascertain diagnoses
13 and measure outcomes; and whether analyses were appropriate and included consideration of
14 confounding variables. Domains were rated using the terms *yes*, *no*, *partial* and *unclear*. Two
15 reviewers independently assessed risk of bias for all articles and discrepancies were
16 discussed. In cases of disagreement, a third reviewer was consulted. The risk of bias
17 assessment is presented alongside the data synthesis to aid interpretation of the research
18 findings.

19 **Data Synthesis**

20 For each paper data were extracted pertaining to study characteristics (authors, year of
21 publication, country), design, participant characteristics, measures used, associations between
22 variables and statistical techniques used to estimate these associations via a data extraction
23 spreadsheet. All data extraction was checked by a second member of the review team and
24 discrepancies resolved through discussion. A narrative synthesis of studies was undertaken
25 due to the variety of constructs and research methodologies being employed across studies

1 making a statistical aggregation of results impossible. A particular difficulty here is that
2 measures often identify specific subtypes of shame or guilt (e.g. body shame, external shame)
3 and it is currently unclear if these different constructs can be treated as comparable or not.
4 Following best practice we focus not only on the significance of reported relationships but
5 also the size, and where possible we consider effect size both in unstandardized and
6 standardized terms (Baguley, 2009). In particular unstandardized mean differences were
7 interpreted by converting scores in to the Proportion of Maximum Score (POMS = [observed-
8 minimum/[maximum=minimum]; Moeller, 2015) before calculating the difference in POMS
9 between groups (Δ POMS). Here we treat Δ POMS \geq 20% as indicative of a substantive
10 difference. Standardized indices of effect included the standardized mean difference (d),
11 correlations (r) and standardized regression coefficients (β).

12 Results

13 Search Results

14 An adapted version of the Preferred Reporting Items for Systematic Reviews
15 (PRISMA) flow chart, depicting the screening process, is presented in Figure 1 (Moher,
16 Liberati, Tatzlaff, & Altman, 2009). The authors of six papers were contacted to obtain
17 further details and establish whether their research satisfied the inclusion criteria. One of the
18 authors offered further clarification and this paper was included (Rockenberger & Brauchle,
19 2011). In total, 239 studies were excluded upon reading the full text. Reasons for exclusion
20 (e.g. neither shame nor guilt measured within the study) can be found in Figure I. This left 24
21 studies to be included in the review.

22 FIGURE 1 ABOUT HERE

23 Overview of Included Studies

24 Details of the 24 papers included in the review can be found in Table 1. Eighteen of
25 the included studies were cross-sectional. Of these, seven studies utilised a non-clinical

1 control group, and three studies compared those with ED presentations with other clinical
2 groups. Three included studies utilised an Experience Sampling Methodology (ESM; a
3 method of collecting self-report data on a momentary basis), and two were longitudinal in
4 nature. The most commonly employed measure of shame was the Experiences of Shame
5 Scale (ESS; Andrews, Qian, & Valentine, 2002; $k = 10$), which assesses exposure to shame in
6 several key domains (bodily, behavioural, characterological). The factor structure, concurrent
7 and predictive validity of this measure has been supported (Andrews et al., 2002). The most
8 widely used assessment of ED symptoms was the Eating Disorders Examination (EDE;
9 Cooper & Fairburn, 1987; $k = 4$), including the self-report adaptation, the EDE-Q (Fairburn
10 & Beglin, 1994; $k = 2$), both of which are widely used and demonstrate good psychometric
11 properties (Berg, Peterson, Frazier & Crow, 2012).

12 TABLE 1 ABOUT HERE

13 **Risk of Bias**

14 Results of the risk of bias assessment can be found in Table 2. Recurrent issues
15 included a lack of clarity around procedures for identifying potential participants (making it
16 difficult to judge the likelihood of selection bias) or a lack of clarity around how the clinical
17 status of participants was ascertained. Samples at times combined sub-clinical and clinical
18 groups or included “recovered” participants within clinical samples. This blurring of the
19 boundary between symptomatic individuals and controls is likely to limit what can be
20 concluded from comparisons. Collectively, the representativeness of these studies with
21 regards to AN and BN clinical status is limited. The majority of the included studies were
22 cross-sectional, with only two utilising a longitudinal design and three utilising ESM. This
23 makes it difficult to make inferences regarding causality or direction of effect. For the few
24 longitudinal designs follow-up periods appeared suitable for tracking the phenomena of
25 interest.

1 with the largest differences apparent for eating-related shame ($k = 1$; $d = 2.77$; $\Delta\text{POMS} =$
2 70%) and the smallest differences apparent for shame proneness ($k = 1$; $d = 0.88$; $\Delta\text{POMS} =$
3 15%). One study reported significant differences in groups on characterological, bodily and
4 eating-related shame, but not behavioural shame when co-varying for depression (Swan &
5 Andrews, 2003). It is possible the analysis lacked power due to small group sizes, but it may
6 also be that co-occurring depression accounts for this difference. In summary shame appears
7 to be substantially greater in AN and BN samples than non-clinical controls, but these data do
8 not provide any indication of whether shame is a cause or consequence of ED difficulties in
9 these studies.

10 TABLE 3 ABOUT HERE

11 ***ED versus clinical controls.*** Individuals with AN or BN presentations typically
12 reported greater shame than those with depression or anxiety-related problems (See Table 3
13 for summary) though differences were smaller than when the comparison was with non-
14 clinical controls. Findings were mixed with regards to subtypes of shame. Shame proneness
15 did not differ between AN/BN and depressed or anxious samples, whilst bodily shame
16 (shame related to body/appearance) was greater in the AN and BN groups (Grabhorn et al.,
17 2006; Rockenberger & Brauchle, 2011). For other clinical groups, findings were again mixed.
18 Rockenberger and Brauchle (2001) reported that shame was greater in their ED sample than
19 those with somatoform disorders (characterological, behavioural, and bodily shame) or
20 adjustment disorders (bodily shame only), but no differences were apparent when compared
21 with a sample diagnosed with personality disorders. Shame proneness did not differentiate
22 any of these clinical groups. However, the concept of shame proneness is based on
23 hypothetical judgements about circumstances when one might feel shame and may differ to
24 actual experiences of shame. Shame (but not shame proneness) may be greater in AN and BN
25 samples than other certain clinical groups (e.g. anxiety, depression) but findings are

1 inconsistent and limited by these data belonging to only two studies (Grabhorn et al., 2006;
2 Rockenberger & Brauchle, 2011).

3 ***Comparisons between ED groups.*** Five studies directly compared AN and BN
4 groups, but no significant differences were reported (See Table 3 for summary; Cella,
5 Cipriano, Innaccone & Cotrufo, 2017; Duarte, Ferreira & Pinto-Gouveia, 2016; Franzoni et
6 al., 2013; Grabhorn et al., 2006; Kollei et al., 2012). Those in AN and BN samples also did
7 not differ from individuals diagnosed with Body Dysmorphic Disorder (BDD; Kollei et al.,
8 2012) or Binge Eating Disorder (Cella et al., 2017; Duarte et al., 2016). In one study those
9 with an EDNOS diagnosis reported greater shame than those diagnosed with AN (Franzoni et
10 al., 2013). Those with current AN/ED symptoms reported greater shame (overall,
11 behavioural, characterological, external, and eating-related shame; no difference for bodily
12 shame), than a recovered ED sample (See Table 3; Cardi et al., 2014; Doran & Lewis, 2011;
13 Swan & Andrews, 2003).

14 ***Correlations with ED symptoms.*** Nine studies reported a significant positive
15 relationship between shame and ED symptom severity. Seven of these used ESS (Andrews,
16 Qian, & Valentine, 2002), reporting moderate to large significant associations with ED
17 symptoms (large ($r = .26 - .79$; Doran & Lewis, 2011; Keith et al., 2009; Kelly & Carter,
18 2013; Kelly & Tasca, 2016), with similar effects across different subtypes of shame
19 (character, behaviour, body, eating). These relationships remained after controlling for self-
20 esteem and perfectionism. Bodily shame was reported to be uniquely predictive of ED
21 symptom severity in a mixed ED clinical sample ($\beta = .32$), when controlling for behavioural
22 and characterological shame (Doran & Lewis, 2011).

23 Body-related shame assessed with another measure was also related to the drive for
24 thinness ($r = .44$). Effects were mixed in one study using a general measure of shame
25 frequency, with a positive association emerging with drive for thinness ($r = .34$), but not the

1 body dissatisfaction ($r = .28$) or bulimia ($r = .16$) subscales of the Eating Disorder Inventory
2 – 2 (Garner, 1991). Cesare and colleagues (2016) found no significant association between
3 shame proneness and ED symptoms in either AN or BN subgroups, though a moderately
4 sized but non-significant correlation between drive for thinness and shame proneness was
5 reported in the AN group ($r = .33$).

6 A number of studies have tested whether shame mediates the effect of other variables
7 upon ED symptoms. Shame mediated the effect of self-objectification, experiences of
8 therapist self-disclosure, teasing, and self-criticism on ED related symptoms (Calogero et al.,
9 2005; Kelly et al., 2013; Simonds & Spokes, 2017; Sweetingham & Waller, 2008). However,
10 as all these studies were cross-sectional the order and direction of effects assumed in these
11 mediation analyses cannot be confirmed. These studies also largely relied on the outdated
12 Baron & Kenny (1986) approach to testing mediation (Hayes & Rockwood, 2017).

13 ***Longitudinal studies.*** One longitudinal study indicated that bodily shame (but not
14 general shame or external shame) predicted AN symptoms (but not BN symptoms) following
15 a 2.5-year period, adjusting for depressive symptoms and baseline AN symptoms ($\beta = .45$,
16 $p < .01$; Troop & Redshaw, 2012). In a second longitudinal study in a general ED sample over
17 a 12-week period, increases in shame positively predicted ED symptoms ($d = .47$; average
18 levels of shame were also predictive of ED symptoms, $d = 1.08$; Kelly & Tasca, 2016). A unit
19 change in shame was related to a subsequent increase in ED symptoms of $B = .72$ (on the
20 EDE-Q), which suggests a substantial effect for this measure (a three-point difference
21 distinguishes the general and ED population on the EDE-Q global score; Aardoom,
22 Dingemans, Slof Op't Landt, & Van Furth, 2012).

23 ***ESM studies.*** Three studies used ESM to map prospective relationships between
24 momentary assessments of shame in those with BN or AN and BN presentations (Berg et al.,
25 2013; De Young et al., 2013; Haynos et al., 2017). All of these studies used the positive and

1 negative affect (PANAS) guilt subscale, but item content suggests this actually measures
2 shame (e.g. “ashamed”, “disgusted at self”), and hence these results are discussed in this
3 section on shame. ESM is a methodology which captures self-report data on a momentary
4 basis. Participants are typically required to record their experiences at several, researcher
5 defined time-points. The three studies suggest a common pattern of shame increasing prior to
6 ED related difficulties (restricted eating, binge, purge, and binge-purge events) and declining
7 afterwards. Shame elevation and reduction pre and post binge/purge events were also
8 significant when controlling for fear, hostility and sadness (Berg et al. 2013). De Young et al.
9 (2013) reported that those with BN reported a significantly greater reduction in momentary
10 shame post-binge episode than those with AN. Moreover, those who did not induce vomiting
11 reported a greater reduction in shame than those who did induce vomiting.

12

13 **Guilt**

14 *ED versus non-clinical controls.* Three studies reported significant differences
15 between AN or BN and non-clinic control groups in reported guilt ($d = 0.70-2.42$; Δ POMS =
16 11-13%; Berghold & Lock, 2002; Kollei, et al., 2012; Overton et al., 2005), including body-
17 related guilt ($d = 1.22-1.23$; Δ POMS = 20-27%; Berghold & Lock, 2002; Kollei, et al., 2012).
18 For one study there was only an effect for “self-hate” guilt, but this construct appears to
19 conceptually overlap with shame. Differences were not apparent for other forms of guilt
20 (survivor, separation and omnipotent responsibility guilt; Berghold & Lock, 2002). In this
21 study comparisons were made against sample data reported in previous papers, which also
22 raises uncertainty about the comparability of the samples.

23 *ED versus clinical controls and ED groups.* A single study reported no differences
24 between an AN and/or BN groups and various clinical groups in terms of guilt proneness ($d =$
25 0-0.30; Δ POMS = 0-5%; Rockenberger & Brauchle, 2011). A single study found no

1 differences in either general or body-related guilt between AN, BN and BDD samples ($d =$
2 0.03-0.29; Δ POMS =1-6%; Kollei, et al., 2012). When comparing AN binge-purge and AN
3 restrictive groups, the former reportedly exhibited greater levels of guilt (Yellowlees, 1985).

4 ***Correlations with ED symptoms.*** One study examined association between guilt and
5 ED symptoms but did not identify any significant associations (Overton et al., 2005), though
6 the small sample ($N = 30$) may have been a factor here.

7 **Discussion**

8 The current review aimed to evaluate the relationship between shame, guilt and ED
9 symptomatology in those with clinical presentations of AN and BN. It was anticipated that
10 shame and guilt would be associated with AN and BN. It was also anticipated that this
11 association would be greater in relation to shame. Shame had received more research
12 attention, with a lack of studies looking at guilt and very few studies considering both
13 emotions together ($k = 3$).

14 The reviewed papers collectively indicated that those diagnosed with AN and BN
15 reported substantially higher levels of shame when compared to non-clinical groups, and also
16 experienced more modestly elevated shame levels compared to other clinical populations
17 (e.g. depression, anxiety) though these findings were more mixed and dependent on type of
18 shame measured. AN, BN and other ED populations were not consistently different on levels
19 of shame indicating that this emotion is not specific to a certain type of ED pathology. As
20 symptoms of AN and BN increased in severity, so did reported levels of shame. Whilst
21 limited to two studies, longitudinal data does suggest that some forms of shame may account
22 for the subsequent severity of ED symptoms, increasing the plausibility that shame is a
23 mechanism leading to ED, as opposed to a consequence of being diagnosed with an ED.
24 Moreover, prospective associations between changes in shame and ED-related behaviours
25 (binging, purging, restricted eating) were identified in ESM studies. Whilst these studies

1 referred to “guilt”, the item content of the measure better reflected feelings of shame (e.g.
2 “ashamed”, “disgusted at self”). Within these studies, momentary feelings of shame appeared
3 to increase before and then decline after ED behaviours. This is consistent with the
4 suggestion that these ED behaviours have a function in regulating feelings of shame (Haedt-
5 Matt & Keel, 2011). However, inferences of causality cannot be made as yet. No such
6 longitudinal associations were apparent for BN symptoms (though the follow-up period was
7 long) and there is greater uncertainty about whether shame is simply a consequence or
8 epiphenomena of BN, rather than a driving factor.

9 Shame related to the body, appearance or eating was most strongly associated with
10 ED, whilst a general proneness to experiencing shame demonstrated more inconsistent
11 associations. It may therefore be helpful clinically and theoretically to distinguish between
12 the focus or source of shame feelings. However, in doing this we emphasise the cognitive-
13 evaluative aspect of shame. The observed prevalence of body related shame in AN and BN
14 groups is suggestive of the propensity to engage in global self-devaluations on the basis of
15 physical appearance (Tangney & Dearing, 2002). No significant differences in bodily shame
16 were found between those with current AN or BN diagnoses and those considered recovered.
17 This suggests that bodily shame is maintained upon recovery, though as only a single study
18 tested this further research is needed.

19 The current review is reflective of previous research which has identified greater
20 levels of shame in those with other ED presentations (e.g. binge-eating disorder; BED) when
21 compared to general population and other clinical groups (e.g. Masheb, Grilo, & Brondolo,
22 1999). The review also supports research reporting a positive correlation between ED
23 symptom severity and shame in sub-clinical groups (e.g. Jankauskiene & Pajaujiene, 2012;
24 Sanftner et al., 1995). Shame may be implicated in the onset of ED presentations, as the
25 associated behaviours may be attempts to avoid such negative feelings towards the self (Goss

1 & Gilbert, 2002; Polivy & Herman, 1993). The impossibility of maintaining attempts to
2 control dietary intake and weight may lead to further shame and in turn a maladaptive shame-
3 ED cycle (Goss & Gilbert, 2002; Skårerud, 2007). The findings of the current review are
4 consistent with Oluyori's (2013) qualitative review, which concluded that shame was
5 implicated in the onset and maintenance of general ED presentations. An alternative
6 explanation is that, as EDs are highly stigmatised (e.g. Zwickert & Rieger, 2013), shame is a
7 product rather than cause of the ED. The lack of longitudinal data makes it impossible to
8 establish the direction of this relationship, and a reciprocal temporal relationship between
9 shame and ED is also plausible.

10 Findings were more varied for guilt, whilst three studies suggested greater guilt
11 amongst AN and BN samples than non-clinical controls, one of these included measures of
12 guilt that conceptually overlap with shame. There was no evidence of guilt proneness being
13 greater in AN or BN samples versus other clinical groups, but other forms of guilt were not
14 tested. Overall there was evidence that shame more consistently differentiated between AN or
15 BN and other samples than guilt, as predicted. There was also no evidence of within-sample
16 associations between guilt and ED symptoms.

17 The majority of papers included within the review were cross-sectional in nature and
18 utilised self-report measures. The results may therefore be subject to inherent bias due to
19 issues associated with retrospective measures. More recently, research has begun to employ
20 ESM designs to explore the aetiology of ED presentations. Continued research in this vein
21 may be informative and help to diminish methodological issues identified in the existing
22 research. A further limitation was the lack of consideration of confounding variables within
23 the papers reviewed. Few papers considered the confounding influence of depression/low
24 mood, and no papers were identified as accounting for guilt when measuring shame, and vice

1 versa. Future research should also consider the potential co-occurrence of guilt and shame
2 and control for this, in addition to depression.

3 The current review focused on those diagnosed with AN or BN (though this could be
4 self-reported) as such diagnosis provides a standardised means of ensuring a high level of
5 clinical severity within the sample. However, diagnosis in ED has been criticised, and these
6 experiences likely exist on a continuum (Dudek, Ostaszewski, & Malicki, 2014). Future
7 reviews of these relationships in non-clinical samples are warranted. The current review did
8 not consider papers which were unavailable in English. This may therefore have resulted in a
9 biased selection of the literature and an incomplete account of the association between shame,
10 guilt, and AN or BN clinical groups. This review focused on peer-reviewed articles and so
11 may have excluded relevant research findings within the grey literature. Whilst focussing on
12 peer-reviewed articles helps ensures all papers have a certain level of rigor, this may also
13 introduce publication bias due to non-significant findings being less likely to be published.

14 The current review provides support for the role of shame in AN and BN
15 presentations. The evidence regarding guilt remains mixed and further research on this
16 emotion would be beneficial. It appears that affect regulation (especially regulation of
17 feelings of shame) may be implicated in the maintenance of these eating difficulties.
18 Therefore, it may be important to consider negative affect and more specifically shame when
19 developing interventions for these clinical groups. This may be particularly true, given that
20 there was evidence bodily shame, unlike other forms of shame, does not appear to remit once
21 an individual is considered to be “recovered”. Whilst current treatment approaches (e.g.
22 CBT) commonly target maladaptive cognitions and behaviours, there is an indication that
23 emotions such as shame may benefit from therapeutic attention. Compassion focused therapy
24 (CFT), an approach which focuses upon developing self-compassion, affect regulation and
25 distress tolerance, may be beneficial to those with AN and BN presentations. It has been

1 found to be useful in the treatment of other psychological presentations characterised by high
2 levels of shame (e.g. Leaviss & Uttley, 2015). As high levels of shame have been identified
3 in those with AN and BN presentations, they may withhold information pertaining to their
4 presentation. Therefore, the development of an effective therapeutic relationship may be of
5 particular importance in these clinical groups (Chakraborty & Basu, 2010). However, at
6 present these findings are tentative due to the methodological limitations identified within the
7 studies reviewed.

References

References relating to studies included in the review are marked with *

American Psychiatric Association. (1980). *Statistical Manual of Mental Disorders* (3rd ed.).

Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association. (1994). *Statistical Manual of Mental Disorders* (4th ed.).

Arlington, VA: American Psychiatric Publishing.

American Psychiatric Association. (2000). *Statistical Manual of Mental Disorders* (4th ed., text revision). Washington, DC: American Psychiatric Publishing.

Andrews, B., Qian, M., & Valentine, J. D. (2002). Predicting depressive symptoms with a new measure of shame: The Experience of Shame Scale. *British Journal of Clinical Psychology, 41*, 29-42. doi: 10.1348/014466502163778

Arcelus, J., Mitchell, A.J., Wales, J & Nielson S (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: A meta analysis of 36 studies. *Archives of General Psychiatry, 68*, 724-731. doi: 10.1001/archgenpsychiatry.2011.74.

Aardoom, J. J., Dingemans, A. E., Slof Op't Landt, M. C., & Van Furth, E. F. (2012). Norms and discriminative validity of the Eating Disorder Examination Questionnaire (EDE-Q). *Eating behaviors, 13*, 305-309. doi: 10.1016/j.eatbeh.2012.09.002

Baron, R. M., & Kenny, D. A. (1986). The moderator- mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182. doi: 10.1037/0022-3514.51.6.1173

Baguley, T. Standardized or simple effect size: What should be reported? *British Journal of Psychology, 100*, 603-617. doi: 10.1348/000712608X377117

- Bauer, S., Winn, S., Schmidt, U., & Kordy, H. (2005). Construction, scoring and validation of the Short Evaluation of Eating Disorders (SEED). *European Eating Disorders Review, 13*, 191-200. doi: 10.1002/erv.637
- *Berg, K. C., Crosby, R. D., Cao, L., Peterson, C. B., Engel, S. G., Mitchell, J. E., & Wonderlich, S. A. (2013). Facets of negative affect prior to and following binge-only, purge-only, and binge/purge events in women with bulimia nervosa. *Journal of Abnormal Psychology, 122*, 111-118. doi: 10.1037/a0029703
- 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*, 428–438. <http://doi.org/10.1002/eat.20931>
- *Berghold, K. M., & Lock, J. (2002). Assessing guilt in adolescents with anorexia nervosa. *American Journal of Psychotherapy, 56*, 378-390. Retrieved from <http://europepmc.org/abstract/med/12400204>
- Beating Eating Disorders. (2012). *The Beat guide to understanding eating disorders*. Norwich: Beat.
- Burney, J., & Irwin, H. J. (2000). Shame and guilt in women with eating-disorder symptomatology. *Journal of Clinical Psychology, 56*, 51-61. doi: 10.1002/(SICI)1097-4679(200001)56:1<51::AID-JCLP5>3.0.CO;2-W
- Blumberg, S. H., & Izard, C. E. (1985). Affective and cognitive characteristics of depression in 10- and 11-year-old children. *Journal of Personality & Social Psychology, 49*, 194–202. doi: 10.1037/0022-3514.49.1.194
- *Cardi, V., Di Matteo, R., Gilbert, P., & Treasure, J. (2014). Rank perception and self-evaluation in eating disorders. *International Journal of Eating Disorders, 47*, 543-552/ doi: 10.1002/eat.22261

Carter, J. C., Blackmore, E., Sutandar-Pinnock, K., & Woodside, D. B. (2004). Relapse in anorexia nervosa: a survival analysis. *Psychological Medicine*, *34*, 671-679. doi:

<https://doi.org/10.1017/S0033291703001168>

*Calogero, R. M., Davis, W. N., & Thompson, J. K. (2005). The role of self-objectification in the experience of women with eating disorders. *Sex Roles*, *52*, 43-50. doi:

10.1007/s11199-005-1192-9

*Cella, S., Cipriano, A., Iannaccone, M., & Cotrufo, P. (2017). Identifying predictors associated with the severity of eating concerns in females with eating disorder.

Research in Psychotherapy: Psychopathology, Process and Outcome, *20*, 91-99.

Retrieved from <https://www.researchgate.net/publication/316101691>.

*Cesare, C., Francesco, P., Valentino, Z., Barbara, D., Oivia, R., Gianluca, C., ...& Enrico, M. (2016). Shame proneness and eating disorders: A comparison between clinical and

non-clinical samples. *Eating & Weight Disorder*, *21*, 701-707. doi: 10.1007/s40519-016-0328-y

Chakraborty, K., & Basu, D. (2010). Management of anorexia and bulimia nervosa: An evidence-based review. *Indian Journal of Psychiatry*, *52*, 174. doi: 10.4103/0019-

5545.64596

Cook, D. R. (1994). *International shame scale professional manual*. Menomonie, WI:

Channel Press.

Cooper, M. (2012). Cognitive behavioural models in eating disorders. In J. R. Fox & K.

Goss (Eds.), *Eating and its disorders* (pp. 204-224). Chichester: John Wiley & Sons.

Cooper, Z., & Fairburn, C. (1987). The eating disorder examination: A semi-structured interview for the assessment of the specific psychopathology of eating

disorders. *International Journal of Eating Disorders*, *6*, 1-8. doi: 10.1002/1098-

108X(198701)6:1<1::AID-EAT2260060102>3.0.CO;2-9

- Cooper, M. J., Wells, A., & Todd, G. (2004). A cognitive model of bulimia nervosa. *British Journal of Clinical Psychology, 43*, 1-16. doi: 10.1348/014466504772812931
- Cuzzolaro, M., Vetrone, G., Marano, G., & Garfinkel, P. E. (2006). The Body Uneasiness Test (BUT): development and validation of a new body image assessment scale. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 11*, 1-13. doi: 10.1007/BF03327738
- *De Young, K. P., Lavender, J. M., Wonderlich, S. A., Crosby, R. D., Engel, S. G., Mitchell, J. E., . . . & Le Grange, D. (2013). Moderators of post-binge eating negative emotion in eating disorders. *Journal of Psychiatric Research, 47*, 323-328. doi: 10.1016/j.jpsychires.2012.11.012
- *Doran, J., & Lewis, C. A. (2012). Components of shame and eating disturbance among clinical and non-clinical populations. *European Eating Disorders Review, 20*, 265-270. doi: 10.1002/erv.1142
- *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: 10.1016/j.comppsy.2016.01.003
- Dudek, J., Ostaszewski, P., & Malicki, S. (2014). Transdiagnostic models of eating disorders and therapeutic methods: The example of Fairburn's cognitive behavior therapy and acceptance and commitment therapy. *Annals of Psychology, 1*, 25-39. doi: 10.1176/appi.ajp.2008.08040608
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*, 363-370. doi: 10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#

- *Ferreira, C., Pinto-Gouveia, J., & Duarte, C. (2013). Self-compassion in the face of shame and body image dissatisfaction: Implications for eating disorders. *Eating Behaviors, 14*(2), 207-210. doi: 10.1016/j.eatbeh.2013.01.005
- Fichter, M. M., Quadflieg, N., Crosby, R. D., Koch, S. (2017). Long-term outcome of anorexia nervosa: Results from a large clinical longitudinal study. *International Journal of Eating Disorder, 50*, 1018-1030. doi: 10.1002/eat.22736
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. (1995). *Structured clinical interview for DSM-IV axis I disorders-patient edition (SCID-I/P, Version 2.0)*. New York, NY: Biometrics Research Department, New York State Psychiatric Institute.
- *Franzoni, E., Gualandi, S., Caretti, V., Schimmenti, A., Di Pietro, E., Pellegrini, G., . . . Pellicciari, A. (2013). The relationship between alexithymia, shame, trauma, and body image disorders: Investigation over a large clinical sample. *Neuropsychiatric Disease and Treatment, 9*, 185-193. doi: 10.2147/NDT.S34822
- Garner, D. M. (1991). *Eating disorder inventory-2*. Odessa, FL: Psychological Assessment Resources.
- Garner, D. M. (2004). *Eating disorder inventory-3 (EDI-3)*. Odessa, FL: Psychological Assessment Resources.
- Garner, D. M., Olmsted, M. P., Bohr, Y., & Garfinkel, P. E. (1982). The eating attitudes test: psychometric features and clinical correlates. *Psychological Medicine, 12*, 871-878. doi: 10.1017/S0033291700049163
- Garner, D. M., Olmsted, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders, 2*, 15-34. doi 10.1002/1098-108X(198321)2:2<15::AID-EAT2260020203>3.0.CO;2-6
- Giannini, M., Pannocchia, P., Dalle Grave, R., Muratori, F., & Viglione, V. (2008). Eating

- disorder inventory-3. Firenze: Giunti OS.
- Goss, K & Allan, S (2009). Shame, pride and eating disorders. *Clinical Psychology and Psychotherapy*, 16, 303-316. doi: 10.1002/cpp.627.
- Goss, K., & Gilbert, P. (2002). Eating disorders, shame and pride: A cognitive-behavioural functional analysis. In P. Gilbert & J. Miles (Eds.), *Body shame: conceptualisation, research and treatment* (pp. 219-255). Hove: Brunner-Routledge.
- Goss, K., Gilbert, P., & Allan, S. (1994). An exploration of shame measures—I: The other as shamer scale. *Personality and Individual Differences*, 17, 713-717. doi: 10.1016/0191-8869(94)90149-X
- Grilo, C. M., Pagano, M. E., Stout, R. L., Markowitz, J. C., Ansell, E. B., Pinto, A., ... & Skodol, A. E. (2012). Stressful life events predict eating disorder relapse following remission: Six-year prospective outcomes. *International Journal of Eating Disorders*, 45, 185-192. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3275672/>
- *Grabhorn, R., Stenner, H., Stangier, U., & Kaufhold, J. (2006). Social anxiety in anorexia and bulimia nervosa: The mediating role of shame. *Clinical Psychology & Psychotherapy*, 13, 12-19. doi: 10.1002/cpp.463
- Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: a meta-analysis of studies using ecological momentary assessment. *Psychological Bulletin*, 137, 660-681. doi: 10.1037/a0023660
- Harder, D. H., & Zalma, A. (1990). Two promising shame and guilt scales: A construct validity comparison. *Journal of Personality Assessment*, 55, 729-745. doi: 10.1080/00223891.1990.9674108
- Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation

analysis in clinical research: Observations, recommendations, and implementation.

Behaviour Research & Therapy, 98, 39-57. doi: 10.1016/j.brat.2016.11.001

*Haynos, A. F., Berg, K. C., Cao, L., Crosby, R. D., Lavender, J. M., Utzinger, L. M.,...Le

Grange, D. (2017). Trajectories of higher and lower-order dimensions of negative and positive affect relative to restrictive eating in anorexia nervosa. *Journal of Abnormal Psychology*, 126, 495-505. doi: 10.1037/abn0000202

Hooge, I.E., Zeelenberg, M & Breugelmans, S.M (2007). Moral sentiments and

cooperation: Differential influences of shame and guilt. *Cognition and Emotion*, 21, 1025-1042. doi: 10.1080/02699930600980874

Izard, C. E., Dougherty, F. E., Bloxom, B. M., & Kotsch, W. E.(1974). *The Differential*

Emotions Scale: A method of measuring the subjective experience of discrete emotions. Unpublished manuscript, Vanderbilt University, Department of Psychology, Nashville, TN.

Jankauskiene, R., & Pajaujiene, S. (2012). Disordered eating attitudes and body shame among

athletes, exercisers and sedentary female college students. *The Journal of Sports Medicine and Physical Fitness*, 52(1), 92-101. Retrieved from

<https://www.minervamedica.it/en/journals/sports-med-physical-fitness/article.php?cod=R40Y2012N01A0092>

*Keith, L., Gillanders, D., & Simpson, S. (2009). An exploration of the main sources of

shame in an eating-disordered population. *Clinical Psychology & Psychotherapy*, 16, 317-327. doi: 10.1002/cpp.629

*Kelly, A. C., & Carter, J. C. (2013). Why self-critical patients present with more severe

eating disorder pathology: The mediating role of shame. *British Journal of Clinical Psychology*, 52, 148-161. doi: 10.1111/bjc.12006

*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, 716-722. doi: 10.1002/eat.22527

Kim, S., Thibodeau, R., & Jorgensen, R. S. (2011). Shame, guilt, and depressive symptoms: a meta-analytic review. *Psychological Bulletin*, 137, 68-96. doi: 10.1037/a0021466.

*Kollei, I., Brunhoeber, S., Rauh, E., de Zwaan, M., & Martin, A. (2012). Body image, emotions and thought control strategies in body dysmorphic disorder compared to eating disorders and healthy controls. *Journal of Psychosomatic Research*, 72, 321-327. doi: 10.1016/j.jpsychores.2011.12.002

Leaviss, J., & Uttley, L. (2015). Psychotherapeutic benefits of compassion-focused therapy: An early systematic review. *Psychological Medicine*, 45, 927-945. doi: 10.1017/S0033291714002141

Luyton, P., Fontaine, J.R.J & Corveleyn J (2002). Does the Test of Self-Conscious Affect (TOSCA) measure maladaptive aspects of guilt and adaptive aspects of shame? An empirical investigation. *Personality and Individual Differences*, 33, 1373-1387. doi: 10.1016/S0191-8869(02)00197-6

Machado, P. P., Gonçalves, S., Martins, C., & Soares, I. C. (2001). The Portuguese version of the eating disorders inventory: Evaluation of its psychometric properties. *European eating disorders review*, 9, 43-52. doi: 10.1002/erv.359

Matos, M., Ferreira, C., Duarte, C., & Pinto-Gouveia. (2015). Eating disorders: When social rank perceptions are shaped by early shame experiences. *Psychology and Psychotherapy: Theory, Research & Practice*, 88, 38-55. doi: 10.1111/papt.1.2027

- Matos, M., Pinto-Gouveia, J., & Duarte, C. (2011). *Other as shamer*. Versão portuguesa e propriedades psicométricas de uma medida de vergonha externa. Manuscript submitted for publication.
- Masheb, R. M., Grilo, C. M., & Brondolo, E. (1999). Shame and its psychopathologic correlates in two women's health problems: Binge eating disorder and vulvodynia. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, 4, 187-193. doi: 10.1007/BF03339735
- Merten, J., & Krause, R. (1992). *DAS (Differentielle Affekt Skala)*. Arbeiten der Fachrichtung Psychologie, Universität des Saarlandes, Nr. 173. Fachrichtung Psychologie, Saarbrücken, Germany.
- Moeller, J. (2015). A word on standardization in longitudinal studies: Don't. *Frontiers in Psychology*, 6, 1389. doi: 10.3389/fpsyg.2015.01389
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Preferred reporting items for systematic reviews and meta-analysis: The PRISMA statement. *International Journal of Surgery*, 8, 336-341. doi: 10.1136/bmj.b2535
- Mulherin, K. (1998). *Reliability and validity for an adolescent version of the interpersonal guilt questionnaire*. Unpublished Manuscript, The Wright Institute, Berkeley, CA.
- Oluyori, T. (2013). A systematic review of qualitative studies on shame, guilt and eating disorders. *Counselling Psychology Review*, 28(4), 47-59. retrieved from <https://shop.bps.org.uk/publications/publication-by-series/counselling-psychology-review/counselling-psychology-review-vol-28-no-4-december-2013.html>
- *Overton, A., Selway, S., Strongman, K., & Houston, M. (2005). Eating disorders- The regulation of positive as well as negative emotion experience. *Journal of Clinical Psychology in Medical Settings*, 12, 39-56. doi: 10.1007/s10880-005-0911-2
- Polivy, J., & Herman, C. P. (1993). Etiology of binge eating: Psychological mechanisms.

In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 173-205). New York, NY: Guilford Press.

Pugh, L., Taylor, P. J., & Berry, K. (2015). The role of guilt in the development of post-traumatic stress disorder: A systematic review. *Journal of Affective Disorders, 182*, 138-150. doi: 10.1016/j.jad.2015.04.026.

*Rockenberger, W., & Brauchle, G. (2011). The significance of shame in different diagnosis groups, with a focus on body shame. *Verhaltenstherapie, 21*, 163-169. doi: 10.1159/000330732

Rosenberg, E. L. (2008). Levels of analysis and the organization of affect. *Review of General Psychology, 2*, 247-270. Retrieved from https://www.researchgate.net/profile/Erika_Rosenberg/publication/232599280_Levels_of_Analysis_and_the_Organization_of_Affect/links/56c49ad508aea564e304bfd9/Levels-of-Analysis-and-the-Organization-of-Affect.pdf

Sanftner, J. L., Barlow, D. H., Marschall, D. E., & Tangney, J. P. (1995). The relation of shame and guilt to eating disorder symptomatology. *Journal of Social and Clinical Psychology, 14*, 315-324. doi: 10.1521/jscp.1995.14.4.315

Skårerud, F. (2007). Shame and pride in anorexia nervosa: A qualitative descriptive study. *European Eating Disorders Review, 15*, 81-97. doi: 10.1002/erv.774

*Simmonds, L. M., & Spokes, N. (2017). Therapist self-disclosure and the therapeutic alliance in the treatment of eating problems. *Eating Disorders, 25*, 151-164, doi:10.1080/10640266.2016.1269557

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*, 123-131. doi: 10.1037//1040-3590.12.2.123

- *Swan, S., & Andrews, B. (2003). The relationship between shame, eating disorders and disclosure in treatment. *British Journal of Clinical Psychology, 42*, 367-378. doi: 10.1348/014466503322528919
- *Sweetingham, R., & Waller, G. (2008). Childhood experiences of being bullied and teased in the eating disorders. *European Eating Disorder Review, 16*, 401-407. doi: 10.1002/erv.839
- Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York, NY: The Guildford Press.
- Tangney, J. P., Dearing, R. L., Wagner, P., & Gramzow, R. (2000). *The test of self-conscious affect-3 (TOSCA-3)*. Fairfax, IA :George Mason University.
- Tangney, J.P., Stuewig, J & Mashek D.J (2007). Moral emotions and moral behaviour. *Annual Review of Psychology, 59*, 345-372.
doi: 10.1146/annurev.psych.56.091103.070145
- Taylor, P. J., Hutton, P., & Wood, L. (2015b). Are people at risk of psychosis also at risk of suicide and self-harm? A systematic review and meta-analysis. *Psychological Medicine, 45*, 911-926. doi: 10.1017/S0033291714002074
- Taylor, P. J., Pyle, M., Schwannauer, M., Hutton, P., & Morrison, A. (2015a). Confirming the structure of negative beliefs about psychosis and bipolar disorder: A confirmatory factor analysis study of the Personal Beliefs about Experience Questionnaire (PBEQ) and Personal Beliefs about Illness Questionnaire (PBIIQ). *British Journal of Clinical Psychology, 54*, 361-377. doi: 10.1111/bjc.12079.
- Treasure, J., Corfield, F., Cardi, V. (2012). A three-phase model of the social emotional functioning in eating disorders. *European Eating Disorder Review, 20*, 431-434. doi: : 10.1002/erv.2181
- Treasure, J., Sepulveda, A. R., MacDonald, P., Whitaker, W., Lopez, C., Zabala, M., ...

- Todd, G. (2008). The assessment of the family of people with eating disorders. *European Eating Disorder Review, 16*, 247-255. doi: 10.1002/erv.859
- *Troop, N. A., & Redshaw, C. (2012). General shame and Bodily Shame in Eating Disorders: A 2.5-Year Longitudinal Study. *European Eating Disorders Review, 20*, 373-378. doi: 10.1002/erv.2160
- Troop, N. A., Sotrilli, S., Serpell, L., & Treasure, J. L. (2006). Establishing a useful distinction between current and anticipated bodily shame in eating disorders. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 11*, 83-90. doi: 10.1007/BF03327756
- Wade, T. D., Keski-Rahkonen A., & Hudson J. (2011). Epidemiology of eating disorders. In M. Tsuang and M. Tohen (Eds.), *Textbook in Psychiatric Epidemiology* (3rd ed.) (pp. 343-360). New York: Wiley.
- Waller, G., & Kennerley, H. (2003). Cognitive-behavioural treatments. In J. Treasure., U. Schmidt., & E. V. Furth (Eds.), *The handbook of eating disorders* (2nd ed., pp. 233-252). Chichester: John Wiley & Sons.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070. doi: 10.1037//0022-3514.54.6.1063
- Williams, J. W., Plassman, B. L., Burke, J., Holsinger, T., Benjamin, S. (2010). *Preventing Alzheimer's disease and cognitive decline. Evidence report/technology assessment No. 193. (Prepared by the duke evidence-based practice center under contract No. HHS 290-2007-10066-I.)*. Rockville, MD: Agency for Healthcare Research and Quality.
- Wilson, G. T., Grilo, C. M., & Vitousek, K. M. (2007). Psychological treatment of eating

disorders. *American Psychologist*, 62, 199-216. doi:

10.1146/annurev.clinpsy.1.102803.144250

World Health Organization. (2010). *International statistical classification of diseases and related health problems* (10th Ed.). Geneva: World Health Organization.

*Yellowlees, A. J. (1985). Anorexia and bulimia in anorexia nervosa: A study of psychosocial functioning and associated psychiatric symptomatology. *The British Journal of Psychiatry*, 146, 648-652. doi: 10.1192/bjp.146.6.648

Zwickert, K., & Rieger, E. (2013). Stigmatizing attitudes towards individuals with anorexia nervosa: an investigation of attribution theory. *Journal of Eating Disorders*, 1(5). doi:10.1186/2050-2974-1-5

Conflict of Interest

None

Table 1
Characteristics of Included Studies

Authors, Year & Country	Design	ED Sample	Comparison Sample	ED Measure	Guilt/Shame Measure
Berg et al (2013), United States of America	Experience Sampling	BN sample (based on DSM-IV-TR) from clinical, community and campus settings; $N = 133$ (100% female; M age = 25.3)	NA	SCID-I/P Eating Disorder Checklist (Author created) EDE	Shame: PANAS
Berghold & Lock (2002), United States of America	Cross-sectional	AN sample (DSM-IV) from an ED clinic; $N = 35$ (94% female; median age = 14 years)	Historic adolescent school sample; $N = 330$ (aged 12-18 years) Historic adult community organisation sample; $N=224$		Guilt: IGQ-69 (adolescent) IGQ-67 (adult)
Calogero et al (2005), United States of America	Cross-sectional	General ED sample; $N = 209$ (100% female); AN = 96, BN = 70, EDNOS = 43	NA	EDI subscales (“drive for thinness”)	Shame: Body shame questionnaire
Cardi et al (2014), United Kingdom	Cross-sectional	General ED sample with current symptoms; $N = 46$ (100% female; M age = 27.3, $SD = 10.2$) Recovered ED sample; $N = 22$ (100% female; M age = 29.5, $SD = 8.4$)	University staff and students; $N = 50$ (100% female; M age = 25.3, $SD = 7.4$)	NA	Shame: OAS, PFQ
Cella et al (2017), Italy	Cross-sectional	General ED sample; $N = 80$ (100% female, M age = 25.35, $SD = 7.68$); AN = 39, BN = 29, BED = 12	NA	EDRC (formed from EDI-3 scales)	Shame: ESS

Cesare et al (2016), Italy	Cross-sectional	General ED sample; $N = 66$ (100% female, M age = 23.36, $SD = 4.86$); AN = 35, BN = 18, BED = 13	NA	EDI-3	Shame: TOSCA
De Young et al (2013), United States of America	Experience Sampling	BN Sample; $N = 121$ (100% female; M age = 25.21, $SD = 7.55$) AN Sample; $N = 47$ (100% female; M age = 25.68, $SD = 8.27$); $N = 27$ met diagnostic criteria (DSM-IV) and $N = 20$ were sub-threshold Both AN and BN samples from clinical, community and educational settings	NA	EDE Eating Disorder Checklist (Author created)	Shame: PANAS (50% of items used)
Doran & Lewis (2011), United Kingdom	Cross-sectional	General ED sample with self-reported diagnosis; $N = 165$ (100% female; M age = 26); AN made up the majority of the sample (specific N unknown).	Non-clinical control sample from schools/colleges and the internet; $N = 1115$ (77% female; female M age = 23; Male M age = 22)	EAT-26 EDRC (formed from EDI-3 scales)	Shame: ESS
Duarte et al (2016), Portugal	Cross-sectional	General ED outpatient sample; $N = 119$; (100% female); AN = 34, BN = 34, BED = 51	NA	EDE	Shame: OAS (Portuguese version)
Ferreira et al (2013), Portugal	Cross-sectional	General ED hospital patient sample; $N = 102$ (100% female; M age = 23.62, $SD = 7.42$); AN = 33, BN = 31, EDNOS = 38	Non-clinical sample from educational and corporate settings; $N = 123$ (100% female; M age = 23.54, $SD = 6.89$)	EDE EDI subscales (“drive for thinness”; “bulimia”; “body dissatisfaction”; p.208) Portuguese	Shame: OAS (Portuguese version)

				version	
Franzoni et al (2013), Italy	Cross-sectional	General ED outpatient sample; $N = 143$ (100% female; M age = 20.3, $SD=30.2$); AN = 67, BN = 52, EDNOS = 24	NA	BUT	Shame: ESS
Grabhorn et al (2006), Germany	Cross-sectional	AN sample; $N = 30$ (M age = 25.5) BN sample; $N = 30$ (M age = 24.9) AN and BN sample both accessing inpatient treatment and psychotherapy	Depression sample; $N = 30$ (M age= 41.1) Anxiety sample; $N = 30$ (M age = 36.9) Depression and anxiety sample both accessing inpatient treatment and psychotherapy	NA	Shame: ISS (German version)
Haynos et al (2017), United States of America	Experience sampling	AN sample; $N = 118$ (100% female; M age = 25.33, $SD = 8.35$); $N = 59$ met diagnostic criteria (DSM-IV) and $N = 59$ were sub-threshold	NA	Restrictive eating (Author created)	Shame: PANAS
Keith et al (2009), United Kingdom	Cross-sectional	General ED sample accessing outpatient services or registered with ED charity; $N = 52$ (100% female; M age = 33.0, $SD = 10.6$); 36.5% outpatients; 63.5% registered with charity); AN = 16; BN = 18; BED = 3; EDNOS = 16.	NA	EDDS	Shame: ESS modified
Kelly & Carter (2013), Canada	Cross-sectional	General ED hospital sample; $N = 74$ (97% female; M age = 27.5, $SD = 9.3$); 31% inpatient; 69% outpatient;	NA	EDE-Q	Shame: ESS

AN restricting subtype = 22, AN binge-purge subtype = 14, BN = 22, EDNOS = 17

Kelly & Tasca (2016), Canada (follow-up of Kelly & Carter; 2013)	Longitudinal	General ED hospital sample; $N = 78$ (97% female; M age = 28.0, $SD = 9.6$); 27.8% inpatient; 72.2% outpatient; AN restricting subtype = 21, AN binge-purge subtype = 14, BN = 23, EDNOS = 19	NA	EDE-Q	Shame: ESS
Kollei et al (2012), Germany	Cross-sectional	AN inpatient sample; $N = 32$ (93.8% female; M age = 26.94, $SD = 9.15$) BN inpatient sample; $N = 34$ (97.1% female; M age = 25.94, $SD = 8.25$)	BDD inpatient and internet self-help group sample; $N = 31$ (61.3% female; M age = 28.77, $SD = 8.91$) Healthy control sample; $N = 33$ (69.7% female; M age = 26.91; $SD = 8.48$)	SCID-I	Shame & Guilt: DES (German version)
Overton et al (2005), New Zealand	Cross-sectional	General ED hospital sample; $N = 30$ (100% female; M age = 28.10, $SD = 10.25$)	Healthy control sample; $N = 100$ (100% female; M age = 23.80; $SD = 8.48$)	EDI-2	Shame & Guilt: DES-IV
Rockenberger & Brauchle (2011), Germany	Cross-sectional	General outpatient ED sample; $N = 27$; AN = 5, BN = 9, atypical BN = 2, over eating = 9, other ED = 1 ED unspecified = 1	General outpatient sample: Affective disorders; $N = 72$; Phobic & other anxiety disorders $N = 45$; Adjustment & stress disorders and mixed anxiety & depression $N = 58$; Somatoform disorders $N = 24$; personality disorders	NA	Guilt: TOSCA Shame: ESS and TOSCA

			<i>N</i> =37		
Simonds & Spokes (2017), United Kingdom		General ED sample from ED charities: <i>N</i> = 120 (96% female; <i>M</i> age = 26.80, <i>SD</i> = 8.07). AN: <i>N</i> =48; BN: <i>N</i> =27; EDNOS: <i>N</i> =21; BED = 3	NA	EAT-26	Shame: ESS
Swan & Andrews (2003), United Kingdom	Cross-sectional	General ED sample from ED association; <i>N</i> = 68 (100% female; <i>M</i> age = 30.67, <i>SD</i> = 10.17); At peak of symptoms: AN = 51, BN = 4, EDNOS = 12, unclassified = 1	Non-clinical control sample (university students & staff): <i>N</i> =72 (<i>M</i> age=26.2, <i>SD</i> = 10.65)	Diagnostic questionnaire based on DSM-IV EAT-26	Shame: ESS modified
Sweetingham & Waller (2008), United Kingdom	Cross-sectional	General ED sample; <i>N</i> = 92 (100% female; <i>M</i> age= 28.50, <i>SD</i> = 8.17); AN = 19, BN = 32, EDNOS = 41	NA	EDI	Shame: ESS
Troop & Redshaw (2012), United Kingdom	Longitudinal	Self-reported general ED sample; <i>N</i> = 55 (100% female; <i>M</i> age=34.6, <i>SD</i> =9.6); AN restrictive = 7, AN binge-purge type = 24, BN = 11, EDNOS = 13	NA	SEED	Shame: BSS; OAS; PFQ
Yellowlees (1985), United Kingdom	Cross-sectional	AN non-binging sample; <i>N</i> = 16 (94.1% female; <i>M</i> age: 20.4) AN binging sample: <i>N</i> = 15 (100% female; <i>M</i> age = 25.8) All historic & current general ED hospital patients, categorised based on DSM-III.	NA	NA	Guilt: Author created questions

Note: some frequencies estimated from percentages reported in papers and due to rounding they sum to a value greater than the total sample size. EDI: Eating Disorders Inventory (Garner, Olmsted & Policy, 1982); EDI-2: Eating Disorder Inventory – 2 (Garner, 1991); EDI-3: Eating Disorder Inventory – 3 (Giannini, Pannocchia, Dalle Grave, Muratori & Viglione, 2008; DSM-IV-TR: Diagnostic and Statistical Manual for Mental Disorders (4th edition., text revision; APA, 2000); SCID-I/P: Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (First, Spitzer, Gibbon, & Williams, 1995); PANAS: Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988); DSM-IV: Diagnostic and Statistical Manual for Mental Disorders (4th edition; APA, 1994); EDE: Eating Disorder Evaluation (Cooper & Fairburn, 1987); IGQ-69: Interpersonal Guilt Questionnaire, Adolescent Version (Mulherin, 1998); EAT-26: Eating Attitudes Test (Garner, Olmsted, Bohr, & Garfinkel, 1982); EDI: Eating Disorder Inventory (Garner, Olmsted, & Polivy, 1983; Portuguese version: Machado, Goncalves, Martins, & Soares, 2001); EDRC: Eating Disorder Risk Composite; EDI-3: Eating Disorder Inventory – 3 (Garner, 2004); OAS: Other as a Shamer Scale (Goss, Gilbert, & Allan, 1994; Portuguese version: Matos, Pinto-Gouveia, & Duarte, 2011); BUT: Body Uneasiness Test (Cuzzolaro, Vetrone, Marano, & Garfinkel, 2006); ESS: Experience of Shame Scale (Andrews, Qian, & Valentine, 2002); ISS: Internalised Shame Scale (Cook, 1994); BED: binge eating disorder; EDNOS: eating disorder not otherwise specified; EDDS: Eating Disorder Diagnostic Scale (Stice, Telch, & Rizvi, 2000); ESS modified: Experience of Shame Scale (modified; Swan & Andrews, 2003); EDE-Q: Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994); BDD: Body dysmorphic disorder; DES: Differential Emotion Scale (Izard, Dougherty, Bloxom, Kotsch, 1974; German version: Merten & Krause, 1992; version IV: Blumberg & Izard, 1985); ICD-10: International Statistical Classification of Diseases and Related Health Problems: 10th Revision (World Health Organisation, 2010); TOSCA: The Test of Self-Conscious Affect-3 (Tangney, Dearing, Wagner, & Gramzow, 2000); SEED: Short Evaluation for Eating Disorders (Bauer, Winn, Schmidt, & Kordy, 2005); BSS: Bodily Shame Scale (Troop, Sottrilli, Serpell, & Treasure, 2006); PFQ: Personal Feelings Questionnaire (Harder & Zalma, 1990); DSM-III: Diagnostic and Statistical Manual for Mental Disorders (3rd edition; APA, 1980)

Table 2
Overview of Assessment of Study Methodological Quality

Authors	Unbiased selection of cohort	Selection minimises baseline differences in demographic factors*	Sample size calculation*	Adequate description of the cohort	Validated method for ascertaining AN and/or BN status	Validated methods for assessing guilt and/or shame	Validated methods for assessing ED symptom severity* ¹	Outcome assessments blind to diagnostic status	Adequate follow-up* ²	Missing data minimal	Analysis controls for confounders*	Analytic methods appropriate*
Berg et al. (2013)	No	NA	No	Yes	Yes	Partial	NA	No	NA	Unclear	Partial	Yes
Berghold & Lock (2002)	Unclear	No	No	Partial	Yes	Partial	NA	No	NA	Unclear	No	Yes
Cardi et al (2014)	No	No	No	Yes	Yes	Yes	Yes	No	NA	Yes	No	Yes
Calogero et al (2005)	Unclear	NA	No	Partial	Yes	No	Yes	No	NA	Yes	No	Partial
Cella et al (2017)	Unclear	NA	No	Yes	Yes	Yes	Yes	No	NA	Yes	Yes	Partial
Cesare et al (2016)	Unclear	NA	No	Partial	Partial	Yes	Yes	No	NA	Unclear	No	Yes
De Young et al (2013)	No	Yes	No	Yes	Partial	Partial	Yes	No	NA	Unclear	No	Yes
Doran & Lewis (2011)	No	No	No	No	No	Yes	Partial	NA	NA	Unclear	No	Yes
Duarte et al (2016)	Unclear	NA	Partial	Yes	Yes	Yes	Yes	Yes	NA	Unclear	No	Yes
Ferreira et al (2013)	Partial	Partial	No	Partial	Partial	Yes	Yes	No	NA	Unclear	No	Yes
Franzoni et al (2013)	Yes	Unclear	No	Partial	Yes	Partial	Yes	No	NA	Unclear	Partial	Yes
Grabhorn et al (2006)	Unclear	No	No	Partial	Yes	Yes	NA	No	NA	Unclear	No	Yes
Haynos et al (2017)	Unclear	NA	No	Partial	Yes	Partial	Partial	No	NA	Unclear	Partial	Yes
Keith,	Unclear	NA	Yes	Partial	No	Yes	Yes	No	NA	Unclear	No	Yes

Gillanders, & Simpson (2009)	Yes	NA	No	Partial	Partial	Yes	Yes	No	NA	Unclear	Partial	Yes
Kelly & Carter (2013)	Unclear	NA	No	Yes	Yes	Yes	Yes	No	Yes	Partial	Partial	Yes
Kelly & Tasca (2016)	Partial	No	No	Yes	Yes	Unclear	NA	No	NA	Unclear	No	Yes
Kollei et al (2012)	Partial	No	No	Partial	Unclear	Yes	Yes	No	NA	Yes	No	Yes
Overton et al (2005)	Yes	Unclear	No	Partial	Partial	Partial	NA	No	NA	Yes	No	Yes
Rockenberger & Brauchle (2011)	No	NA	No	Yes	No	Yes	NC	NA	No	No	No	Yes
Simmonds & Spokes (2017)	No	No	No	Partial	Partial	Yes	NA	No	NA	Unclear	Partial	Yes
Swan & Andrews (2003)	Yes	NA	No	Partial	Yes	Yes	Yes	No	NA	Unclear	No	Partial
Sweetingham & Waller (2008)	No	NA	Yes	Partial	No	Yes	Yes	No	Yes	No	Partial	Yes
Troop & Redshaw (2012)	Unclear	No	No	No	Partial	Unclear	NA	No	NA	Unclear	No	Unclear
Yellowlees (1985)												

* Criteria only applicable to certain designs; ¹ Note that this criterion only applied to those studies which measured severity of ED symptoms ² Note that this criterion only applied to longitudinal studies.

Table 3

Summary of Differences and Effect Sizes for Studies Comparing Shame between Groups

Outcome	Predictor	# studies	# significant associations / # associations tested	Δ POMS (%)	<i>d</i>
AN/BN vs. Non-clinical controls ^b	Shame ^a	4	6/6	15 - 44%	0.88 - 2.81
	Behavioural shame	1	0/1	35%	1.46
	Bodily shame	2	3/3	23 - 45%	1.20 - 1.76
	Characterological shame	1	1/1	52%	2.40
	Eating-related shame	1	1/1	70%	2.77
	External shame	2	2/2	21% - 33%	1.26 - 2.16
	Shame proneness	1	1/1	15%	0.88
AN/BN vs. anxiety/depression ^c	Shame ^a	2	5/6	13 - 29%	0.67 - 1.92
	Shame proneness	1	0/2	2 - 9%	0.12 - 0.49
	Behavioural shame	1	1/2	6 - 13%	0.22 - 0.51
	Bodily shame	1	2/2	31%	1.02 - 1.04
	Characterological shame	1	1/2	16 - 21%	0.65 - 0.83
AN/BN vs. other clinical groups ^b	Shame ^a	1	1/3	16 - 22%	0.61-1.05
	Shame proneness	1	0/3	-1 - 11%	-0.06 - 0.57
	Behavioural shame	1	1/3	-4 - 17%	-0.16 - 0.67
	Bodily shame	1	2/3		
	Characterological shame	1	1/3	6- 24%	0.23 - 1.10
AN vs. BN ^c	Shame ^a	4	0/4	-5 - -7%	-0.43 - -0.21
	Bodily shame	1	0/1	2%	0.07
	External shame	1	0/1	-7%	-0.34
AN/BN vs. other ED ^b	Shame ^a	3	1/6	-4- -14%	-0.63 - -0.28
	Shame proneness	1	0/2	-3 - 4%	-0.17 - 0.30

	Bodily shame	1	0/2	-10 - -11%	-0.50 - -0.45
	External shame	1	0/2	-3 - -10%	-0.46- -0.16
Current AN/BN vs. recovered ^d	Shame ^a	2	2/2	12 - 28%	1.08 - 1.31
	Behavioural shame	1	0/1	19%	0.78
	Bodily shame	1	0/1	22%	0.92
	Characterological shame	1	1/1	31%	1.25
	Eating-related shame	1	1/1	32%	1.14
	External shame	1	1/1	20%	1.05

^a Refers to general measures of shame that do not focus on a specific or distinct subtype (we include the concept of internal shame under this heading); ^b Positive values denote greater shame in the AN/BN group; ^c Positive values denote greater shame in the AN group; ^d Positive values denote greater shame in the current AN/BN group

Figure Legend

Figure 1. Flow of Information through the Systematic Information Review Process

Figure 1



