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RUNNING HEAD: SHAME, GUILT AND EATING DISORDERS

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

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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. binging 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

- 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 binging, 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

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

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

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

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

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

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

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

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

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

Method

Search Strategy

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

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

Inclusion Criteria

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

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

Risk of Bias Assessment

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

Data Synthesis

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

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

Results

Search Results

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

FIGURE 1 ABOUT HERE

Overview of Included Studies

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

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

TABLE 1 ABOUT HERE

Risk of Bias

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

The potential impact of confounding variables was often overlooked (and relatedly matching of groups on demographic variables where relevant). No papers controlled for guilt when measuring shame, or shame when measuring guilt. This is particularly important because, as previously stated, they commonly co-occur and overlap conceptually (Tangney et al., 1992). Similarly, where group comparisons were made, these groups were rarely matched on relevant variables (e.g. socio-demographics). The validity of parameter estimates may be affected by not taking into account possible confounding variables. Blinding or masking of researchers to participant status or research question was rare, but this may have also introduced detection bias, especially where interview-based measures were used (e.g. researchers may be more vigilant in asking about ED symptoms when they know shame is present). Only two of the included papers reported having completed power calculations (Keith Gillanders, & Simpson, 2009; Troop & Redshaw, 2012). Levels of missing data and how this was managed was often not clearly reported creating uncertainty about whether missing data posed a problem or how it was managed. The studies largely used measures with known and adequate psychometric properties.

TABLE 2 ABOUT HERE

Shame

ED versus non-clinical controls. A summary of results and effect sizes is reported in Table 3 for studies investigating shame using group comparison designs. Individuals with AN or BN presentations reported greater shame compared to non-clinical control groups, with typically large effect sizes (Cardi, Di Matteo, Gilbert & Treasure, 2014; Cesare et al., 201; Doran & Lewis, 2011; Ferreira et al., 2013; Kollei et al., 2012; Overton, Selway, Strongman & Houston, 2005; Swan & Andrews, 2003). These differences were apparent across multiple forms of shame (shame related to body/physical appearance; shame related to personal attributes/character; shame related to behaviour; external shame; shame related to eating)

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

TABLE 3 ABOUT HERE

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

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

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

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

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

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

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

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

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

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

Guilt

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

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

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

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

Discussion

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

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

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

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

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

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

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

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

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

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

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

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

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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)	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	EDE	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

		N=37			
Simonds & Spokes (2017), United Kingdom		General ED sample from ED charities: *N* = 120 (96% female; *M* age = 26.80, *SD* = 8.07). AN: *N*=48; BN: *N*=27; EDNOS: *N*=21; BED = 3	NA	EAT-26	Shame: ESS
Swan & Andrews (2003), United Kingdom	Cross-sectional	General ED sample from ED association; *N* = 68 (100% female; *M* age = 30.67, *SD* = 10.17); At peak of symptoms: AN = 51, BN = 4, EDNOS = 12, unclassified = 1	Non-clinical control sample (university students & staff): *N*=72 (*M* age=26.2, *SD*= 10.65)	Diagnostic questionnaire based on DSM-IV EAT-26	Shame: ESS modified
Sweetingham & Waller (2008), United Kingdom	Cross-sectional	General ED sample; *N* = 92 (100% female; *M* age= 28.50, *SD* = 8.17); AN = 19, BN = 32, EDNOS = 41	NA	EDI	Shame: ESS
Troop & Redshaw (2012), United Kingdom	Longitudinal	Self-reported general ED sample; *N* = 55 (100% female; *M* age=34.6, *SD*=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; *N* = 16 (94.1% female; *M* age: 20.4) AN binging sample: *N* = 15 (100% female; *M* 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 & Vigilione, 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, Sotrilli, 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)												
Kelly & Carter (2013)	Yes	NA	No	Partial	Partial	Yes	Yes	No	NA	Unclear	Partial	Yes
Kelly & Tasca (2016)	Unclear	NA	No	Yes	Yes	Yes	Yes	No	Yes	Partial	Partial	Yes
Kollei et al (2012)	Partial	No	No	Yes	Yes	Unclear	NA	No	NA	Unclear	No	Yes
Overton et al (2005)	Partial	No	No	Partial	Unclear	Yes	Yes	No	NA	Yes	No	Yes
Rockenberger & Brauchle (2011)	Yes	Unclear	No	Partial	Partial	Partial	NA	No	NA	Yes	No	Yes
Simmonds & Spokes (2017)	No	NA	No	Yes	No	Yes	NC	NA	No	No	No	Yes
Swan & Andrews (2003)	No	No	No	Partial	Partial	Yes	NA	No	NA	Unclear	Partial	Yes
Sweetingham & Waller (2008)	Yes	NA	No	Partial	Yes	Yes	Yes	No	NA	Unclear	No	Partial
Troop & Redshaw (2012)	No	NA	Yes	Partial	No	Yes	Yes	No	Yes	No	Partial	Yes
Yellowlees (1985)	Unclear	No	No	No	Partial	Unclear	NA	No	NA	Unclear	No	Unclear

* 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	ΔPOMS (%)	*d*
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

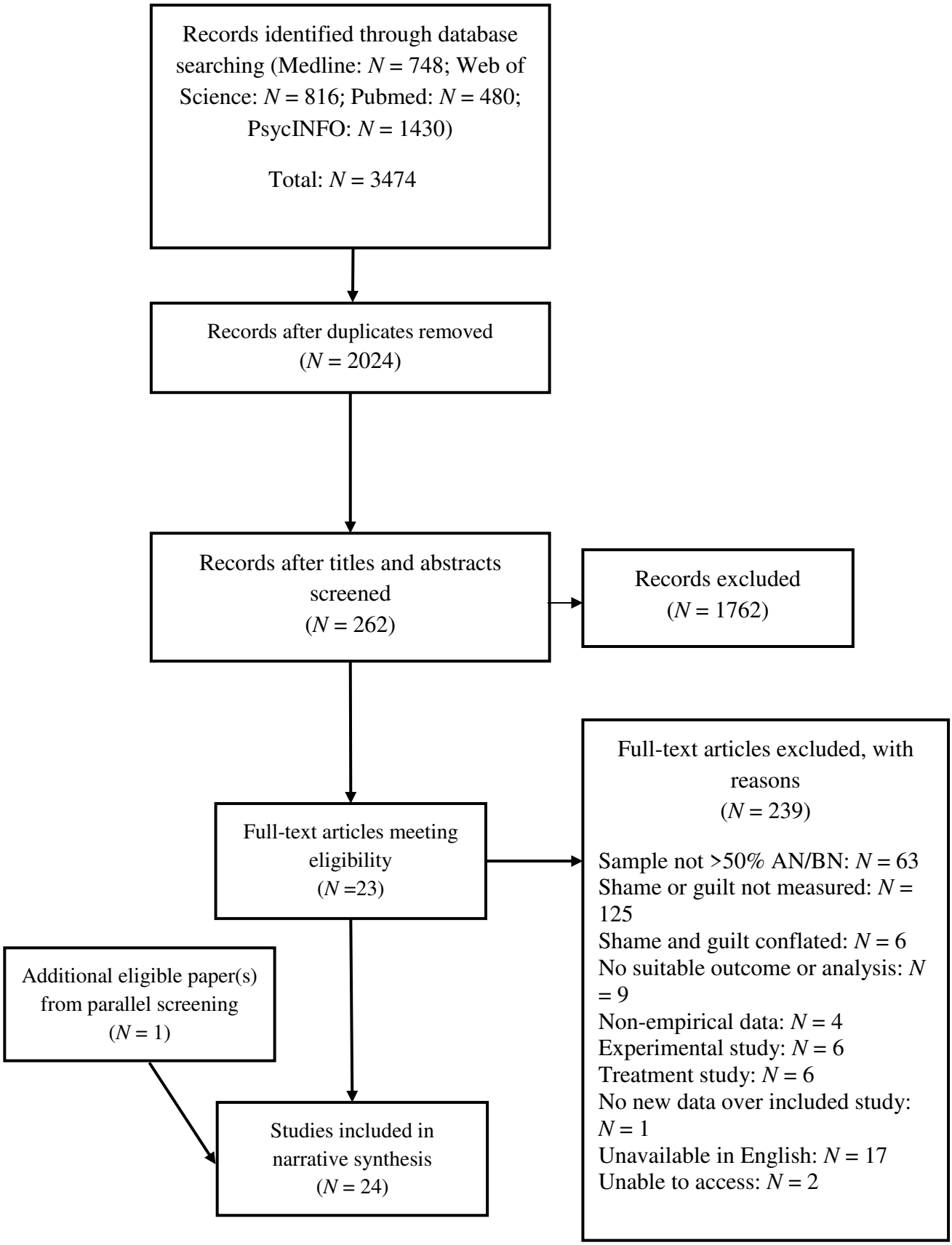
	Bodily shame	1	0/2	-10 - -11%	-0.50 - -0.45
	External shame	1	0/2	-3 - -10%	-0.46- -0.16
Current AN/BN vs. recovered[d]	Shame[a]	2	2/2	12 - 28%	1.08 - 1.31
	Behavioural shame	1	0/1	19%	0.78
	Bodily shame	1	0/1	22%	0.92
	Characterological shame	1	1/1	31%	1.25
	Eating-related shame	1	1/1	32%	1.14
	External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


Records identified through database searching (Medline: N = 748; Web of Science: N = 816; Pubmed: N = 480; PsycINFO: N = 1430)
Total: N = 3474
Records after duplicates removed (N = 2024)
Records after titles and abstracts screened (N = 262)
Records excluded (N = 1762)
Full-text articles meeting eligibility (N =23)
Full-text articles excluded, with reasons (N = 239)
Sample not >50% AN/BN: N = 63
Shame or guilt not measured: N = 125
Shame and guilt conflated: N = 6
No suitable outcome or analysis: N = 9
Non-empirical data: N = 4
Experimental study: N = 6
Treatment study: N = 6
No new data over included study: N = 1
Unavailable in English: N = 17
Unable to access: N = 2
Additional eligible paper(s) from parallel screening (N = 1)
Studies included in narrative synthesis (N = 24)