Body Checking and Body Avoidance in Eating Disorders: Systematic Review and Meta-Analysis

Alexandra Nikodijevic ^a, Kimberly Buck ^{a,b}, Matthew Fuller-Tyszkiewicz ^{c,d}, Tara de Paoli ^a,
& Isabel Krug ^a

^a Melbourne School of Psychological Sciences, The University of Melbourne, Victorian
Australia; 14-20 Blackwood Street, VIC 3010, Melbourne, Australia;

^b Southern Synergy, Department of Psychiatry, Monash University, 126-128 Cleeland St,
Dandenong, Victoria, Australia 3175.

^c School of Psychology, Deakin University, Geelong, Victoria, Australia 3220

^d Center for Social and Early Emotional Development, Deakin University, Geelong,
Victoria, Australia 3220

*Address for correspondence:

Isabel Krug, PhD, Senior Lecturer in Clinical Psychology, University of Melbourne,
Psychology Clinic, 14-20 Blackwood Street, Vic 3010, Melbourne, Australia; Tel: +
61390358551; Fax: +61393264774; e-mail: Isabel.krug@unimelb.edu.au

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^a Melbourne School of Psychological Sciences, The University of Melbourne,
Victorian Australia; 14-20 Blackwood Street, VIC 3010, Melbourne, Australia;

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Psychology Clinic, 14-20 Blackwood Street, Vic 3010, Melbourne, Australia; Tel: +
61390358551; Fax: +61393264774; e-mail: Isabel.krug@unimelb.edu.au

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Abstract

This review sought to systematically review and quantify the evidence related to body checking and body avoidance in eating disorders (ED) to gauge the size of effects, as well as examine potential differences between clinical and nonclinical populations, and between different ED subtypes. PsycINFO, PsycARTICLES, PsycEXTRA, Cochrane Library, and MEDLINE databases were searched for academic literature published until October 2017. A grey literature search was also conducted. A total of 52 studies were identified for the systematic review, of which 34 were eligible for meta-analysis. Only female samples were included in the meta-analysis. ED cases experienced significantly higher body checking ($d=1.26, p<.001$) and body avoidance ($d=1.88, p<.001$) overall relative to healthy controls, but neither behaviour varied by ED subtype. In nonclinical samples, body checking ($r=0.60$) and body avoidance ($r=0.56$) were significantly correlated with ED pathology ($p<.001$). These findings support transdiagnostic theoretical models and approaches to ED treatment and early-intervention programs.

Keywords: eating disorders, body checking, body avoidance, eating pathology

Abbreviations: 13-FS: 13 Figure Scale; AN: Anorexia Nervosa; AN-BP: Anorexia Nervosa Binging/Purging Subtype; AN-R: Anorexia Nervosa Restricting Subtype; ANZAED: Australian and New Zealand Academy for Eating Disorders; BA: Body Avoidance; BC: Body Checking; BCAQ: Body Checking and Avoidance Questionnaire; BCCS: Body Checking Cognitions Scale; BCQ: Body Checking Questionnaire; BD: Body Dissatisfaction; BED: Binge Eating Disorder; BIAQ: Body

Image Avoidance Questionnaire; BICAS: Body-Image Compulsive Actions Scale; BIAS: Body-Image Avoidance Scale; BMI: Body Mass Index; BN: Bulimia Nervosa; BRBS: Body-Related Behaviours Scale; BT-EDNOS: Bulimic-Type Eating Disorder Not Otherwise Specified; CI: Confidence Interval; DSM: Diagnostic and Statistical Manual of Mental Disorders; EAT: Eating Attitudes Test; ED: Eating Disorder; EDE: Eating Disorder Examination Interview; EDE-Q: Eating Disorder Examination Questionnaire; EDI: Eating Disorder Inventory; EDNOS: Eating Disorder Not Otherwise Specified; ICED: International Conference on Eating Disorders; MBCQ: Male Body Checking Questionnaire; N/A: Not Applicable; OSFED: Other Specified Feeding and Eating Disorder; PRISMA: Preferred Reporting for Systematic Reviews and Meta-Analyses.

Body Checking and Body Avoidance in Eating Disorders: A Systematic Review and
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Cognitive-behavioural models conceptualise the overvaluation of weight and shape as the core psychopathology of eating disorders (ED; Fairburn, Cooper, & Shafran, 2003; Fairburn & Harrison, 2003). This concept refers to an individual's judgement of their self-worth being based primarily on perceptions of weight and shape (Fairburn et al., 2003; Farrell, Shafran, & Lee, 2006). According to Fairburn and colleagues' (2003) transdiagnostic model of EDs, body checking and body avoidance are overt behavioural manifestations of this overvaluation of weight and shape. Body checking refers to an individual's tendency to critically scrutinise and repeatedly check their weight and shape through behaviours such as ritualistic weighing, compulsive mirror checking, and using the fit of clothes to judge weight changes (Fairburn, Shafran, & Cooper, 1999). Conversely, body avoidance describes an individual's tendency to consciously evade situations that may facilitate evaluation of their appearance (e.g., clothes shopping) whilst also engaging in body-related avoidant behaviours such as covering mirrors, wearing over-sized clothes, and refusing to be weighed (Rosen, Srebnik, Saltzberg, & Wendt, 1991). Beyond their association with the overvaluation of weight and shape, body checking and body avoidance also feature prominently in theoretical frameworks on the development and maintenance of EDs (Fairburn et al., 2003).

As an ED progresses, changes in weight and shape become the primary gauge of perceived self-control or failure over one's body (Reas & Grilo, 2004). Body

checking and body avoidance are hypothesised to contribute to the maintenance of an ED by reinforcing distorted beliefs about changes in weight and shape (Fairburn et al., 2003; Shafran, Fairburn, Robinson, & Lask, 2004). Body checking is thought to amplify the perceived failure of control over weight, shape, and eating, which in turn reinforces disordered eating, encourages further checking, and strengthens pre-existing distorted beliefs about one's body (Fairburn et al., 1999; Reas, Grilo, Masheb, & Wilson, 2005). In contrast, body avoidance provides temporary relief from distress regarding changes in weight and shape (Reas & Grilo, 2004). As a result, the use of body avoidance is negatively reinforced, which further prevents the disconfirmation of distorted beliefs concerning one's body (Reas & Grilo, 2004; Reas et al., 2005).

Within clinical populations, cross-sectional research has consistently demonstrated that body checking occurs at significantly higher rates among individuals with EDs compared to healthy controls (e.g., Blechert, Ansorge, & Tuschen-Caffier, 2010; Calugi, Dalle Grave, Ghisi, & Sanavio, 2006; Mountford, Haase, & Waller, 2006; Øverås, Kapstad, Brunborg, Landrø, & Lask, 2015; Waller, Sines, Meyer, & Mountford, 2008) and more recent longitudinal evidence lends support to the causal relationship between body checking and core ED symptomatology (Calugi, El Ghoch, & Dalle Grave, 2017; Trottier, MacDonald, McFarlane, Carter, & Olmsted, 2015). Similarly, body avoidance has also been found to occur at significantly higher rates among individuals with EDs compared to healthy controls (e.g., Vocks, Grönemeyer, Schulte, Herpertz, & Suchan, 2010; Vocks,

Legenbauer, Rüddel, & Troje, 2007) and contribute to the maintenance of EDs (Trottier, MacDonald, et al., 2015).

A growing body of research in nonclinical samples suggests that body checking and body avoidance also function as risk factors for the development of clinical EDs. For example, recent correlational research has documented significant positive associations between body checking and body avoidance and core symptoms of ED pathology, including the overvaluation of weight and shape (Hildebrandt, Walker, Alfano, Delinsky, & Bannon, 2010), body dissatisfaction (Vartanian & Grisham, 2012), drive for thinness (Alperin, Hornsey, Hayward, Diedrichs, & Barlow, 2014), and dietary restraint (De Berardis et al., 2007; Meyer, McPartlan, Rawlinson, Bunting, & Waller, 2011). Experimental evidence also points to a negative causal link between body checking and body avoidance and eating pathology (Bailey & Waller, 2017). For example, Shafran et al. (2007) demonstrated that compared to women who were asked to check their bodies non-critically in a mirror for 30 minutes, women who examined themselves critically (“high body checking condition”) experienced greater increases in body dissatisfaction. Given that there is a high prevalence of nonclinical disordered eating in the general population (Latner, Mond, Vallance, Gleaves, & Buckett, 2012), this emerging body of research may hold valuable evidence to inform prevention strategies and early intervention programs for EDs.

A question that has received less attention within the ED literature is whether body checking and body avoidance behaviours occur with differing frequency and severity across ED subtypes. From a clinical perspective, it is important to disentangle

the impact of body checking and body avoidance behaviours across diagnostic ED groups to improve the effectiveness and specificity of ED treatment and early intervention programs. Additionally, findings regarding potential group differences between ED subtypes may have salient implications for transdiagnostic theoretical models of EDs, which suggest that because all ED subtypes share common characteristics and underlying psychopathology, they can be treated using similar psychological interventions (Fairburn et al., 2003). However, a common problem in assessing differences in body checking and avoidance between diagnostic groups is achieving adequate sample sizes across the various subtypes to enable meaningful comparisons (e.g., Brytek-Matera, 2009; Kraus, Lindenberg, Zeeck, Kosfelder, & Vocks, 2015; Mountford et al., 2006; Reas, Whisenhunt, Netemeyer, & Williamson, 2002; Vocks, Stahn, Loenser, & Legenbauer, 2009; Waller et al., 2008). The small number of studies that have been sufficiently powered to assess such differences have often produced ambiguous and contradictory findings, particularly in relation to body checking. For example, Calugi and colleagues (2006) reported significantly higher levels of body checking in individuals with Bulimia Nervosa (BN), compared to Anorexia Nervosa (AN), but found no significant differences in body checking between the ED not otherwise specified (EDNOS) group, and BN or AN groups, respectively. In contrast, several other studies found that body checking did not significantly differ between AN, BN or EDNOS groups (Amin, Strauss, & Waller, 2014; Blechert et al., 2010; Kachani, Brasiliano, Cordás, & Hochgraf, 2013). The pattern of findings in relation to body avoidance is somewhat clearer, with a number

of studies suggesting that body avoidance does not differ between AN or BN groups (Blechert et al., 2010; Kachani, Barroso, Brasiliano, Hochgraf, & Cordás, 2014; Vocks et al., 2010) or between AN, BN, or EDNOS groups (Amin et al., 2014; Shafran & Robinson, 2004).

A viable alternative method of overcoming the current lack of studies assessing body checking and avoidance behaviours across ED subtypes is to use meta-analytic techniques, which combine effect sizes across available studies (Field, 2013). The pooling of data, particularly from small sample studies which may not have reached statistical significance on their own, increases statistical precision and power, and therefore, the initial constraint of low power of analyses ceases to be a limiting factor (Field, 2013; Finckh & Tramèr, 2008). Additionally, the aggregating of data also enables the ability to assess for potential heterogeneity in effect sizes across studies (Borenstein, Hedges, Higgins, & Rothstein, 2009).

The Current Study

Given that the majority of literature relating to body checking and body avoidance in EDs has been published in recent years, coupled with the above-mentioned gaps and inconsistencies in the literature, a synthesis of relevant studies is both timely and warranted. Therefore, the aims of this study were to:

1. Assess the occurrence of body checking and body avoidance in EDs (irrespective of subtype), in contrast to healthy control groups.
2. Assess whether the size of differences between ED and healthy control groups on body checking and body avoidance differed depending on ED subtypes (i.e., AN,

BN, binge eating disorder (BED), and other specified feeding or eating disorder (OSFED, previously EDNOS in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV; American Psychiatric Association [APA], 2000)).

3. Assess the relationship of body checking and body avoidance to ED pathology in nonclinical samples. Nonclinical samples were defined as participants with no previous history of an ED.

Method

Systematic Review

Search Strategy. The systematic search was conducted in accordance with the Preferred Reporting for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). A search for relevant academic literature was conducted utilising five international databases (PsycINFO, PsycARTICLES, PsycEXTRA, Cochrane Library, and MEDLINE Complete) for papers written in English and published in peer-reviewed journals until October 2017. The search strategy utilised the keywords of ‘body checking’ OR ‘body avoidance’ and cross-referenced these, using the conjunction AND with each of the following search terms: (1) ‘eating disorder*’ (2) anorex* OR bulimi* OR ‘binge eating disorder’ (3) ‘disordered eating’ (4) ‘body dissatisfaction’ and (5) weight OR shape. No field restrictions were applied. Please see Appendix A for the full search syntax. This component of the search was independently completed and confirmed by two reviewers (AN and TDP or KB).

A supplementary search of the ProQuest Dissertations & Theses database and the conference programs of two major international ED conferences (Australian and New Zealand Academy for Eating Disorders (ANZAED); International Conference on Eating Disorders (ICED)) was also carried out to identify relevant unpublished literature. The search of the ProQuest database used the same search terms and parameters as the academic database search, and the available proceedings of ANZAED (2008-2016) and ICED (2006-2016) conferences were hand searched for abstracts referring to body checking or body avoidance in clinical or nonclinical populations.

Inclusion and Exclusion Criteria. The inclusion criteria for the review were that studies: (1) examined and measured body checking and/or body avoidance, and (2) utilised at least one variable which measured ED pathology, or separated groups by ED status/diagnosis. A study was excluded from the review if it measured body checking, body avoidance and/or eating pathology using single item measures as this was regarded as an inadequate measure of the construct. Studies that measured body checking and/or body avoidance but did not report any relevant data pertaining to the aims of the current review were also excluded. All study designs were eligible with the exception of ecological momentary assessment designs, as the review focused on trait-level relationships rather than relationships from moment-to-moment. However, experimental and prospective studies that did not measure body checking and/or body avoidance at baseline were excluded in order to enable data to be more readily compared with data from cross-sectional studies.

Quality Appraisal and Assessment of Risk of Bias. As recommended in the Cochrane Handbook for Systematic Reviews (Higgins & Green, 2011), the quality and risk of bias of each study in the systematic review was evaluated using a framework by Downs and Black (1998). As this tool was created to assess clinical trials, criteria were adapted for the current study based on previous reviews in the ED literature (e.g., Rozenblat et al., 2017). A brief description of the items in their current application are presented in Appendix B in the supplementary material. Studies were evaluated independently by two coders (AN and KB), and any discrepancies were resolved by discussion and consensus with a senior author (IK).

Meta-analysis

Inclusion and Exclusion Criteria. To be eligible for inclusion in the meta-analysis, the study must have provided effect size estimates for rates of body checking, body avoidance, and/or disordered eating symptoms, or statistics suitable for their calculation (i.e., means, standard deviations and/or correlations of interest). If insufficient information was reported, the corresponding author was contacted and asked to provide the relevant data. In order to avoid repeating the same analyses among studies of lower quality (i.e., due to the absence of a control frequency), studies that utilised an ED sample without a control group were excluded.

Statistical analysis. Data were analysed using the R package *metafor* (Viechtbauer, 2010). For each analysis, a forest plot displays the overall summary effect – and subgroup effects where applicable – presented with 95% confidence intervals (95% CIs). A multi-level meta-analysis approach was used to account for

clustering of effects within studies. For comparisons of EDs (both overall cases and ED subtypes) against healthy control groups, Cohen's d values were used as a measure of effect size, and the recommendations of Cohen (1988) were followed, where 0.2 is a small, 0.5 a medium, and 0.8 a large effect size. Positive d values were taken here to indicate that ED cases scored higher on body checking and/or body avoidance, whereas negative d values indicate healthy controls scored higher. In nonclinical samples, the correlation coefficient (r) was used as the effect size measure between body checking and body avoidance, and disordered eating symptoms. The recommendations of Cohen (1988) were followed, where 0.1 is a small, 0.3 is a medium, and 0.5 is a large effect size. For these analyses, r values were converted to Fisher's z transformed values to ensure accuracy of outputs. The values were then back-transformed into r values for all reporting to enable results to be provided in an interpretable format (i.e., r values ranging from -1 to +1).

Because we aimed to examine effects associated with ED cases overall as well as effects related to different ED subtypes, we first tested the meta-analysis result ignoring which ED subtype was being compared against healthy controls. We then tested whether ED subtype moderated the effect sizes. Forest plots thus provide the overall effect size and effect sizes for each subtype separately. Similarly, in nonclinical samples, correlational analyses were first conducted overall and then followed up with moderation analyses to test whether effect sizes differed depending on what form of ED behaviour was correlated against body checking or body avoidance. Because available data on specific ED behaviours was limited, we

amalgamated these ED variables into three superordinate categories: Total ED score, body image (which included weight and shape concerns and body dissatisfaction), and restraint (which included behavioural restraint and eating concerns).

Given that past research has illustrated that ED subtypes differ as a function of age and BMI (e.g., Blechert et al., 2010; Shafran et al., 2004), additional follow-up meta-regressions analyses were conducted to determine whether effect sizes were moderated by mean age and mean BMI for ED groups in analyses examining ED cases versus healthy controls and for the overall sample in analyses in nonclinical samples. Several other variables were initially considered for their potential impact as moderators, including publication status (published vs. unpublished) and ED severity (inpatient vs. outpatient sample). However, these variables were not practical to model because they either had too few cases or their inclusion resulted in other primary variables dropping out of the meta-regression.

The random-effects method was utilised in all analyses, as it was assumed that the effects might vary between study samples (Borenstein et al., 2009). The heterogeneity of samples was assessed using Q and I^2 statistics, where the Q -value provides a test of the null hypothesis that all studies in the analysis share a common effect size, and I^2 reflects the percentage of variation between studies that is due to sample mean heterogeneity (Borenstein et al., 2009). For I^2 values, we followed the recommendations of Higgins, Thompson, Deeks, and Altman (2003), whereby 25% corresponds to a small I^2 value, 50% a moderate, and 75% a large I^2 value. The differences between ED cases and healthy controls were compared with

the z -test, and the Q -value was used to compare the effect sizes between ED subtypes (Borenstein et al., 2009). In the following analyses, $\alpha = 0.05$ was used unless stated otherwise.

Results

Systematic Review

The academic database search identified 1599 articles, and 560 additional unpublished records (dissertations/theses: $n = 551$; conference abstracts: $n = 9$) were identified through other sources. A summary of the search strategy is shown in Figure 1. Following the removal of duplicates, 786 records were excluded based on title and a further 44 were excluded based on abstract. 121 full-text records were assessed for eligibility for the review. Based on the inclusion and exclusion criteria, 69 full-text articles were excluded. Of these, 28 studies were omitted as they did not examine body checking and/or body avoidance in a clinical ED population or a nonclinical population. A further 12 studies were excluded as they measured body checking and/or body avoidance using only one item; two treatment studies were omitted as they did not measure body checking and/or body avoidance at baseline; five studies utilised the same dataset; six studies were excluded as ED symptomatology was not measured; and 16 studies measured but did not report any relevant data pertaining to the aims of the current study. Therefore, a total of 52 articles met the selection criteria and were included in the systematic review (see Figure 1).

--- Insert Figure 1 here ---

Study characteristics. Tables 1, 2, and 3 summarise the 52 studies that fulfilled the inclusion criteria for the systematic review. Overall, a total of 15,564 people participated in the studies reviewed, including 11,818 females (4,906 from ED samples and 6,912 from nonclinical samples) and 3,746 males (102 from ED samples and 3,644 from nonclinical samples). The mean age of participants ranged from 14 years to 78 years of age and body mass index (BMI) varied across samples. The BMI of participants with an ED ranged from 11.50 to 40.13 kg/m² which is reflective of the various ED subtypes. The BMI of nonclinical samples demonstrated greater variability, ranging from 13.21 to 60.47 kg/m². The ethnicity of included participants was predominately Caucasian, and the majority of studies were retrieved from the United Kingdom ($n = 12$), the United States ($n = 12$), Germany ($n = 8$) and Italy ($n = 5$). Only a small number of studies provided details on other demographic and clinical characteristics such as illness duration and socioeconomic status, which therefore precluded summarisation.

In regards to study samples, a total of 30 studies (see Table 1 and Table 2) examined body checking and/or body avoidance in an ED sample, however, only 19 of these studies utilised a control group. The remaining 22 studies examined body checking and/or body avoidance in a nonclinical population (Table 3). As indicated in Tables 1, 2 and 3, overall, 25 studies assessed body checking only, whilst nine studies only assessed body avoidance. The remaining 18 studies examined both body checking and body avoidance. Research designs were predominantly cross-sectional

($n = 40$), with the remaining studies utilising experimental/quasi-experimental ($n = 7$) or longitudinal ($n = 5$) designs.

Eating disorder diagnoses and measures. The DSM-IV (APA, 2000) was most commonly used to derive ED diagnoses. Only two studies (Calugi et al., 2006; Calugi et al., 2017) utilised the diagnostic questions of the Eating Disorder Examination interview (EDE 12.0D; Fairburn & Cooper, 1993). Within all relevant studies, diagnoses were made by trained clinicians. Overall, a total of 3,208 people were diagnosed with ED. Of these, 908 were diagnosed with AN, 1,243 with BN, 728 with EDNOS/OSFED, and 329 with BED.

In regards to the questionnaire measures utilised, the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994) was the most widely used measure of ED pathology, followed by the Eating Disorder Inventory-2 (EDI-2; Garner, 1991), and the Eating Attitude Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982). As shown in Tables 1, 2 and 3, the majority of studies utilised the Body Checking Questionnaire (BCQ; Reas et al., 2002) to measure body checking and the Body Image Avoidance Questionnaire (BIAQ; Rosen et al., 1991) to measure body avoidance. However, two studies used the Body-Related Behaviours Scale (BRBS; Meyer et al., 2011); two studies utilised the Body Checking Cognitions Scale (BCCS; Mountford et al., 2006); four studies used the Body Checking and Avoidance Questionnaire (BCAQ; Shafran et al., 2004); and four studies utilised the Male Body Checking Questionnaire (MBCQ; Hildebrandt et al., 2010).

Eating disorder sample (with a control group). A total of 19 studies examined body checking and/or body avoidance in an ED sample utilising a control group. As indicated in Table 1, eight of these studies assessed body checking, whilst two studies assessed body avoidance. The remaining nine studies examined both body checking and body avoidance. A total of 1,330 people were diagnosed with an ED, and there were 1,800 healthy controls. Of those with an ED, 519 were diagnosed with AN, 479 with BN, 271 with EDNOS/OSFED, and 61 with BED.

Body checking. As shown in Table 1, 16 studies found significantly higher body checking scores in EDs overall compared to healthy controls. Only one study (Lewer et al., 2016) found no significant differences between the two groups.

In regards to ED subtypes, Legenbauer et al. (2017) reported significantly higher levels of body checking among individuals with AN relative to both BED and EDNOS, and among individuals with BN relative to BED. Another study (Calugi et al., 2006) reported significantly higher levels of body checking among BN relative to AN, however, no significant differences were found between EDNOS, and BN or AN groups, respectively. In line with the latter finding, five studies (Amin et al., 2014; Blechert et al., 2010; Kachani et al., 2013; Shafran et al., 2004; Shafran & Robinson, 2004) found no significant differences in body checking scores across AN, BN or EDNOS groups. A further five studies (Carmona et al., 2015; Kraus et al., 2015; Mountford et al., 2006; Reas et al., 2002; Vocks et al., 2009; Waller et al., 2008) contrasted body checking in EDs versus a healthy control group, however, the various

ED subtypes were amalgamated and analysed as a single sample. As a result, potential group differences between ED subtypes were not examined.

Body avoidance. As shown in Table 1, nine studies found significantly higher body avoidance scores in EDs overall compared to healthy control groups. Only one study (Lewer et al., 2016) found no significant differences between the two groups. In regards to ED subtypes, five studies (Amin et al., 2014; Blechert et al., 2010; Legenbauer et al., 2017; Shafran et al., 2004; Vocks et al., 2010) found no significant differences in body avoidance scores across AN, BN, BED, and/or EDNOS groups.

--- Insert Table 1 here ---

Eating disorder sample (without a control group). A total of 11 studies (see Table 2) examined body checking and/or body avoidance in an ED sample without a control group. Of these, six studies assessed body checking, whilst only two studies assessed body avoidance. The remaining three studies examined both body checking and body avoidance. A total of 1,878 people were diagnosed with an ED, specifically, 389 with AN, 764 with BN, 457 with EDNOS/OSFED, and 268 with BED.

Body checking. One study (Kachani et al., 2014) reported significant differences between ED subtypes, with BN scoring higher on body checking scores, relative to AN. Conversely, two studies (Dakanalis, Carrà, et al., 2015; MacDonald, McFarlane, & Olmsted, 2014) found no significant differences in body checking across BN, EDNOS, or BED groups. In a total of five studies (Breithaupt, Payne, &

Rose, 2014; Morgan et al., 2014; Mountford et al., 2015; Mountford et al., 2007; Trottier, MacDonald, et al., 2015), ED subtypes were combined and analysed as a single sample, and thus, potential differences were not examined. The final study (Reas et al., 2006) only examined one ED subtype so no comparisons were made.

Body avoidance. One study (MacDonald et al., 2014) compared body avoidance across ED subtypes, however, no significant differences were found. Consistent with the pattern observed in the literature, in three studies (Brytek-Matera, 2009; Morgan et al., 2014; Trottier, MacDonald, et al., 2015), ED subtypes were amalgamated and analysed as a single sample. In the remaining study (Vossbeck-Elsebusch et al., 2015), although body avoidance scores were reported separately for each ED subtype, analytic comparisons were not conducted.

--- Insert Table 2 here ---

Nonclinical population. A total of 22 studies examined body checking and/or body avoidance in a nonclinical population, with the majority of participants drawn from university samples. As indicated in Table 3, 11 studies assessed body checking, and five studies assessed body avoidance. The remaining six studies examined both body checking and body avoidance.

Body checking. As shown in Table 3, 12 studies reported significant positive correlations between body checking and eating pathology as measured by the EDE-Q subscales of eating concern, restraint, shape concern, and weight concern. Conversely,

one study (Jansen et al., 2016) found no significant association between body checking and the EDE-Q. Two studies (respectively) reported a significant positive correlation between body checking and drive for thinness (Alperin et al., 2014; Chang, 2014), bulimic behaviours (Chang, 2014; Dakanalis, Favagrossa, et al., 2015), and the total score of the EAT-26 (De Berardis et al., 2007; Engle, 2009). Three studies reported a positive association between body checking and body dissatisfaction (Chang, 2014; Pellizzer et al., 2017; Vartanian & Grisham, 2012)

Body avoidance. As shown in Table 3, six studies reported significant positive correlations between body avoidance and the EDE-Q subscales of eating concern, restraint, shape concern, and weight concern. Conversely, one study (Jansen et al., 2016) found no significant association between body avoidance and the EDE-Q. Two studies reported significant positive correlations between body avoidance and body dissatisfaction (Carmona et al., 2015; Pellizzer et al., 2017), and two studies reported a significant positive correlation between body avoidance and the total score of the EAT-26 (Engle, 2009; Rodgers, Melioli, Laconi, Bui, & Chabrol, 2013).

--- Insert Table 3 here ---

Quality Appraisal and Assessment of Risk of Bias. The appraisal and assessment of quality and risk of bias found that, by and large, studies adopted valid and reliable methods, with clear reporting of results. The main issues, and potential sources of bias in this systematic review, pertained to non-representative samples,

poor control for potential confounding variables, failure to report exact probability values, and insufficient power to detect small effect sizes (see Appendix B for the results of the quality appraisal). Nonetheless, the studies present promising initial findings and constitute a good foundation for continued analyses in the field.

Meta-Analysis

As seen in Figure 1, 34 studies were eligible for the meta-analysis. In total, 31 corresponding authors were contacted and asked to provide additional data (see Appendix C and D in the supplementary material for extracted data), most commonly in relation to data for each separate ED subtype. When contacting the authors, it became apparent that several papers were derived from the same dataset: a) Blechert et al. (2009) and Blechert et al. (2010); and b) White and Warren (2013) and White et al. (2015). In order to ensure that participants were not artificially over-represented, only the paper that contained the most comprehensive data was selected from each dataset; and therefore, two papers (Blechert et al., 2009; White & Warren, 2013) were excluded. It is important to note that these studies differ from those excluded during the systematic review selection process, as it was only upon correspondence that it became known that the same data had in fact been utilised. Furthermore, the majority of included papers utilised samples consisting entirely of females. Given that disordered eating behaviours and weight and shape concerns are more prevalent among females (Croll, Neumark-Sztainer, Story, & Ireland, 2002) and are expressed differently among males (Weltzin, Weisensel, Franczyk, Burnett, Klitz, & Bean,

2005), a decision was made to exclude the two papers that consisted of all male samples (Dakanalis, Favagrossa, et al., 2015; Walker et al., 2009) and to use only the female data from studies with mixed gender samples. Thus, all results reported hereafter refer to female samples. Two studies (Shafran et al., 2004; Shafran & Robinson, 2004) were also excluded as they utilised the BCAQ (Shafran & Robinson, 2004), which did not differentiate between body checking and body avoidance items.

Eating disorders vs. healthy control groups: Body checking. This analysis was based on the 10 studies (see Figure 2a) that compared body checking in females with EDs (separated into subtypes) versus healthy female control groups. Within the 10 studies, AN was examined in nine, BN in seven, BED in three, and EDNOS/OSFED in five. The overall summary effect was significant ($d = 1.26$, 95% CI [1.06, 1.47], $Z = 12.09$, $p < 0.001$), suggesting that EDs overall (regardless of subtype) experience significantly higher body checking, with a large effect size, relative to healthy control groups. There was considerable heterogeneity between studies, as evidenced by a significant Q value ($Q = 94.05$, $p < 0.001$) and a moderate I^2 value ($I^2 = 62.85$). Follow up meta-regression analysis revealed that effect sizes did not significantly differ between the ED subtype groups (EDNOS vs BN: $b = 2.95$, 95% CI [-3.07, 8.96], $z = 0.96$, $p = 0.34$; EDNOS vs BED: $b = 3.36$, 95% CI [-6.49, 13.21], $z = 0.67$, $p = 0.50$; EDNOS vs AN: $b = 2.98$, 95% CI [-3.20, 9.15], $z = 0.94$, $p = 0.35$), or by the mean age ($b = -.10$, 95% CI [-0.44, 0.24], $z = -0.56$, $p = 0.58$) or BMI of the ED group ($b = 0.04$, 95% CI [-0.21, 0.30], $z = 0.32$, $p = 0.75$). With these potential

moderators included, the effect size for body checking remained heterogeneous across studies; $Q = 39.27, p < 0.001$.

Eating disorders vs. healthy control groups: Body avoidance. This analysis was based on eight studies (see Figure 2b) that compared body avoidance in females with EDs (separated into subtypes) versus healthy female control groups. One study (Kachani et al., 2013) that utilised the BCAQ (Shafran & Robinson, 2004) was excluded. Within the eight studies, AN was examined in five, BN in five, BED in two, and EDNOS in two. The overall summary effect was significant ($d = 1.88$, 95% CI [1.22, 2.54], $Z = 5.60, p < 0.001$), suggesting that EDs overall (regardless of subtype) experience significantly higher body avoidance, with a large effect size, relative to healthy control groups. There was considerable heterogeneity between studies, as evidenced by a significant Q value ($Q = 92.52, p < 0.001$), and a large I^2 value ($I^2 = 92.15$), indicating that the original studies differed from each other. Follow up meta-regression analysis revealed that effect sizes significantly differed between several of the ED subtype groups (EDNOS vs BN: $b = 7.70$, 95% CI [1.29, 14.11], $z = 2.36, p = 0.02$; EDNOS vs AN: $b = 7.82$, 95% CI [1.61, 14.03], $z = 2.47, p = 0.01$; but non-significant for EDNOS vs BED: $b = 9.52$, 95% CI [-0.66, 19.71], $z = 1.83, p = 0.07$; EDNOS vs AN: $b = 2.98$, 95% CI [-3.20, 9.15], $z = 0.94, p = 0.35$). Effect sizes did not differ as a function of mean age ($b = -0.16$, 95% CI [-0.40, 0.08], $z = -1.33, p = 0.18$) or BMI of the ED group ($b = -0.05$, 95% CI [-0.22, 0.13], $z = -0.55, p = 0.59$). With these potential moderators included, the effect size for body avoidance remained heterogeneous across studies; $Q = 63.76, p < 0.001$.

---Insert Figure 2 here ---

Eating disorder pathology in nonclinical samples: Body checking. This analysis was based on 14 studies (see Figure 3a) that assessed the relationship between body checking and ED pathology in female nonclinical samples. As previously mentioned, insufficient data on specific ED behaviours (e.g., eating concern, shape concern, body dissatisfaction) necessitated grouping the individual categories into three superordinate categories: Total ED score, body image, and restraint. As illustrated in Figure 3a, body checking was significantly and positively correlated with ED pathology overall, with a large effect size, $r = .60$, 95% CI [0.56, 0.64], $p < 0.001$. A significant Q value ($Q = 252.25$, $p < 0.001$) and moderate-large I^2 value ($I^2 = 77.52$) indicated the studies differed notably from each other. Follow up meta-regression analysis revealed that effect sizes did not significantly differ as a function of operationalisation of ED symptomatology (ED total score vs restraint score: $b = -0.06$, 95% CI [-0.21, 0.08], $z = -0.84$, $p = 0.40$; ED total score vs body image score: $b = -0.01$, 95% CI [-0.18, 0.15], $z = -0.13$, $p = 0.90$), mean age ($b = -.01$, 95% CI [-0.02, 0.00], $z = -1.40$, $p = 0.16$) or BMI of the sample ($b = 0.00$, 95% CI [-0.05, 0.04], $z = -0.04$, $p = 0.96$). With these potential moderators included, the effect size for body checking remained heterogeneous across studies; $Q = 196.35$, $p < 0.001$.

Eating disorder pathology in nonclinical samples: Body avoidance. This analysis was based on the nine studies (see Figure 3b) that assessed the relationship

between body avoidance and ED pathology in female nonclinical samples. As with the previous analysis, insufficient data on specific ED behaviours necessitated grouping the individual categories into the three superordinate categories of total ED score, body image, and restraint. Given that two studies (McLean et al., 2011; Trautmann, Worthy, & Lokken, 2007) used alternative scoring methods for the BIAQ, the data were not comparable and these studies were excluded. As illustrated in Figure 3b, body avoidance was significantly and positively correlated with ED pathology overall, with a large effect size, $r = 0.56$, 95% CI [0.46, 0.64], $p < 0.001$. The significant Q value ($Q = 465.92$, $p < 0.001$) and large I^2 value ($I^2 = 91.40$) indicated the studies differed notably from each other. Follow up meta-regression analysis revealed that effect sizes significantly differed as a function of operationalisation of ED symptomatology (ED total score vs restraint score: $b = 0.28$, 95% CI [0.15, 0.41], $z = 4.39$, $p < 0.001$; ED total score vs body image score: $b = 0.16$, 95% CI [0.05, 0.27], $z = 2.91$, $p = 0.003$) and mean age ($b = 0.05$, 95% CI [0.04, 0.06], $z = 9.84$, $p < 0.001$), but not by BMI of the sample ($b = -.03$, 95% CI [-0.09, 0.02], $z = -1.14$, $p = 0.26$). However, even with these moderators included, the effect size for body checking remained heterogeneous across studies; $Q = 99.53$, $p < 0.001$.

--- Insert Figure 3 here ---

Discussion

This is the first systematic review and meta-analysis of the literature related to body checking and body avoidance in EDs. Although suggested to be important contributors to the development and maintenance of EDs (Fairburn et al., 2003), to date, these behaviours have not previously been studied by means of a meta-analytical approach. This study therefore set out to collate, summarise, and provide an objective appraisal of the literature, before extending the knowledge base by using meta-analytic methods to pool data from existing studies. The results showed that overall, ED cases experienced significantly higher body checking and body avoidance relative to healthy controls, with large effect sizes. In regards to ED subtypes, the analyses provided no evidence that body checking or body avoidance varied by diagnostic category. The findings also revealed that body checking and body avoidance were significantly and positively correlated with core ED pathology in nonclinical samples.

Clinical Eating Disorder Population vs. Healthy Controls

Meta-analytic summary effects showed that ED cases overall experienced significantly higher body checking and body avoidance relative to healthy controls. Although the heterogeneity of observed effects prompts cautious interpretation, this finding corroborates increasing evidence (see Kachani et al., 2013) that although body checking and body avoidance are common in the general population, these behaviours occur at significantly higher rates among individuals with EDs. These results are consistent with theoretical accounts of EDs (e.g., Fairburn et al., 2003) that identify body checking and body avoidance to be the behavioural expressions of the overevaluation of weight and shape, which is considered the core psychopathology of

EDs (Fairburn et al., 2003). The current findings are also in line with research suggesting that body-related information gained from body checking and body avoidance is processed differently in individuals with EDs compared to the general population (Walker & Murray, 2014). For instance, similar to the way in which selective attention to internal cues is believed to maintain panic disorder, selective attention towards disliked body parts is believed to maintain disordered weight and shape concern in EDs (Shafran, Farrell, Lee, & Fairburn, 2009). In illustration of this, individuals with EDs almost always selectively attend to their most disliked body parts when viewing themselves, in contrast to controls (Shafran et al., 2004), which increases negative body-related emotions and the use of body avoidance strategies (Tuschen-Caffier, Vögele, Bracht, & Hilbert, 2003; Vocks, Kosfelder, Wucherer, & Wächter, 2008). Subsequently, the overvaluation of weight and shape is intensified (Shafran et al., 2004).

Eating Disorder Subtypes vs. Healthy Controls

Given the inconsistent findings in the literature related to body checking and body avoidance across diagnostic categories of EDs, we aimed to evaluate whether the size of differences between clinical ED groups and healthy control groups on body checking and avoidance was moderated by ED subtype (i.e., AN, BN, BED, and EDNOS/OSFED). Results revealed no evidence to suggest that effect sizes varied across ED diagnostic categories. As the first study to use meta-analytic methods to compare body checking and body avoidance across ED subtypes, this novel finding has important implications. Most importantly, it lends support to the transdiagnostic

model of EDs (Fairburn et al., 2003), which is based on the premise that all ED subtypes share common characteristics and underlying psychopathology, and therefore, can be treated using similar psychological interventions. Our results suggest that instead of administering separate interventions targeting body checking or body avoidance to each ED subtype (e.g., Morgan et al., 2014), which can be both time- and resource-intensive, transdiagnostic treatment interventions and early-intervention programs can be developed to target these behaviours across all subtypes.

It is also important to consider that the non-significant finding across ED categories may be related to other, as yet unexplored factors within the field, such as lower-level distinctions within subtypes. For instance, the DSM-5 (APA, 2013) separates AN into two further subtypes – AN-restricting (AN-R) and AN-binge/purge (AN-BP). Whilst there is a high degree of crossover between these subtypes (Peat, Mitchell, Hoek, & Wonderlich, 2009), research has shown that individuals with AN-BP demonstrate greater diagnostic similarities with BN than those with AN-R (Eddy et al., 2002). It is therefore possible that there may be distinguishing differences in body checking and body avoidance if AN and BN were instead examined according to the restricting versus binge/purge division (Eddy et al., 2008). Because only one (Waller et al., 2008) of the 10 studies that assessed AN in this meta-analysis distinguished between AN-R and AN-BP, we were unable to make such comparisons.

Nonclinical Samples

Within nonclinical samples, meta-analytic summary effects showed that both body checking and body avoidance were significantly and positively correlated with

ED symptomatology, with large effect sizes. Because of the lack of subscale data reported for specific ED behaviours in some included studies (e.g., De Berardis et al., 2007; Pellizzer et al., 2017), we amalgamated available variables into three categories of ED symptomatology (total ED score, body image, and restraint). Moderation analyses indicated that effect sizes did not differ depending on which of these three variables body checking or body avoidance were correlated against. However, there is a clear need for future studies to continue to explore and clarify the relationships between specific ED behaviours (e.g., body dissatisfaction, drive for thinness, etc.) and body checking and body avoidance in nonclinical populations.

Despite the small number of studies in this area, the meta-analytic results add further support to the developing body of research on the relationship between body checking and body avoidance, and core ED symptoms in nonclinical samples. Importantly, body image concerns are known risk factors in the development and maintenance of EDs (Allen, Byrne, Oddy, Schmidt, & Crosby, 2014). For instance, eating, shape and weight concern in early adolescence has been shown to significantly predict later-onset EDs, relative to control groups, over and above childhood exposures such as childhood obesity (Allen et al., 2014). Therefore, given that body checking and body avoidance are common in the general population (Reas et al., 2002), coupled with the current findings that these behaviours are significantly and positively associated with core ED symptoms, early-intervention and prevention programs that are able to successfully reduce body checking and body avoidance may help to prevent the onset of clinical EDs in those at risk. This may involve the use of

behavioural experiments and response prevention to reduce body checking or body avoidance (Bailey et al., 2017; Waller et al., 2007), or exposure-based methods to reduce the use of checking or avoidance in response to feelings of anxiety.

Psychoeducation and cognitive-behavioural therapies could also play a role in addressing beliefs and cognitions underlying the development of body checking and body avoidance behaviours (Bailey et al., 2017).

Limitations and Strengths

The current study had several limitations which must be acknowledged. Perhaps most importantly, considerable heterogeneity of observed effects were detected within meta-analytic analyses, even after the inclusion of age and BMI as potential moderators. Given that the high level of heterogeneity of effect sizes across analyses could not be explained by the modelled variables, it will be important for future studies to explore the potential moderating effect of other relevant variables, such as sample type and publication status, which could not be modelled in this study due to small samples or missing data. A further limitation was the exclusion of male samples in the meta-analysis to provide a more homogenous sample. It would be beneficial for future research to examine body checking and body avoidance behaviours among males to explore potential gender differences, and to inform ED prevention and treatment strategies among males.

Notwithstanding these limitations, the current review had a number of strengths. Most noticeably, a large number of studies were included, which allowed distinct analyses to be undertaken. The use of meta-analytic methods to pool effect

sizes also enabled the current review to adequately disentangle, for the first time, whether body checking and body avoidance differ across ED subtypes. Furthermore, the inclusion of unpublished content limited the potential impact of publication bias that may have been present if only peer-reviewed publications had been included (Borenstein et al., 2009). Finally, our critical examination of the included studies using a quality appraisal and assessment of bias rating system allowed us to make specific recommendations to assist the methodology of future studies.

Future Directions and Conclusions

Our quality appraisal of risk of bias within the included studies revealed that the most common unmet criteria across all studies related to non-representative samples, the asynchronous recruitment of cases and controls, and failure to control for potential confounding variables. Consequently, future studies should aim to more carefully control sample features and recruitment, such as the inclusion of male participants; information regarding the source population (i.e., name and type of hospital); the use of larger samples spanning the spectrum of EDs; and increased efforts to reduce the heavy reliance on convenient cohorts (i.e., treatment-seeking participants). Additionally, in order to promote the contemporaneous recruitment of participants, cases and controls should be recruited over the same time period.

Although the literature on body checking and body avoidance in EDs is rapidly expanding, this review identified research gaps in several key areas. For example, we were unable to test whether distinguishing AN and BN according to restricting versus binge/purge divisions resulted in any differences in body checking

or avoidance between ED subtypes. Given that there are both diagnostic similarities and distinctions between AN-R, AN-BP and BN (Eddy et al., 2008), there is a clear need for future studies to distinguish between AN subtypes to facilitate more nuanced comparisons. Furthermore, the relationships between several core ED pathologies (i.e., bulimic symptoms and body dissatisfaction) and body checking and body avoidance have yet to be adequately examined in nonclinical samples.

This meta-analysis extends the knowledge of body checking and body avoidance in EDs, and provides several novel findings. Meta-analytic summary effects showed that ED cases experienced significantly higher body checking and body avoidance relative to healthy controls, but that body checking and body avoidance did not vary by ED subtype. This finding has salient implications for transdiagnostic theoretical models and treatment approaches. Furthermore, body checking and body avoidance were significantly and positively correlated with core ED symptoms in nonclinical samples, which could have the potential to inform early-intervention and prevention programs.

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Table 1

Studies Investigating Body Checking and/or Body Avoidance in an Eating Disorder Sample (with a Control Group)

Author(s)	Publication status	Sample	Measure(s)	Body Checking Results	Body Avoidance Results
1. Amin et al. (2014)*	Published	<p><i>N</i> = 261 (100% female)</p> <p>99 ED (outpatient sample): 28 AN; 46 BN; 25 EDNOS (mean age = 30.4, <i>SD</i> = 9.44; mean BMI = 21.9, <i>SD</i> = 6.39)</p> <p>162 HC (university sample) (mean age = 24.0, <i>SD</i> = not reported; mean BMI = 22.5, <i>SD</i> = not reported)</p>	<p>BRBS (BC & BA subscales)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BC subscale:</p> <ul style="list-style-type: none"> - ED > HC <p>No significant differences between ED subtypes</p>	<p>Significant group differences on BA subscale:</p> <ul style="list-style-type: none"> - ED > HC <p>No significant differences between ED subtypes</p>
2. Bamford et al. (2014)*	Published	<p><i>N</i> = 160 (100% female)</p> <p>100 ED (inpatient sample): 56 AN low-weight (mean age = 26.0, <i>SD</i> = 9.38; mean BMI = 14.94, <i>SD</i> = 1.34); 44 AN weight-restored (mean age = 24.75, <i>SD</i> = 8.99; mean BMI = 18.59, <i>SD</i> = 0.47)</p> <p>60 HC (community sample) (mean age = 25.06, <i>SD</i> = 10.81; mean BMI = 22.02, <i>SD</i> = 2.75)</p>	<p>BCQ (total score)</p> <p>BIAQ (total score)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <ul style="list-style-type: none"> - AN low-weight > HC - AN weight-restored > HC <p>No significant differences between AN groups</p>	<p>Significant group differences on BIAQ:</p> <ul style="list-style-type: none"> - AN low-weight > AN weight-restored - AN low-weight > HC - AN weight-restored > HC

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3. Blechert et al. (2010)*	Published	<p><i>N</i> = 58 (100% female)</p> <p>37 ED (community sample): 19 AN (mean age = 23.5, <i>SD</i> = 4.66; mean BMI = 16.5, <i>SD</i> = 1.35); 18 BN (mean age = 26.9, <i>SD</i> = 8.35; mean BMI = 22.9, <i>SD</i> = 3.39)</p> <p>21 HC (community sample) (mean age = 27.1, <i>SD</i> = 4.77; mean BMI = 20.3, <i>SD</i> = 2.12)</p>	<p>BCQ (total score)</p> <p>BIAQ (total score)</p> <p>EDE-Q (total score)</p>	No significant differences between AN and BN	No significant differences between AN and BN
4. Blechert et al. (2009)	Published	<p><i>N</i> = 42 (100% female)</p> <p>20 ED (community sample): all BN (mean age = 26.6, <i>SD</i> = 7.68; mean BMI = 22.6, <i>SD</i> = 3.40)</p> <p>22 HC (community sample) (mean age = 26.5, <i>SD</i> = 4.65; mean BMI = 20.3, <i>SD</i> = 2.24)</p>	<p>BCQ (total score)</p> <p>BIAQ (total score)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <p>- BN > HC</p>	<p>Significant group differences on BIAQ:</p> <p>- BN > HC</p>

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5. Calugi et al. (2006)*	Published	<i>N</i> = 573 (100% female) (overall mean age = 24.1, <i>SD</i> = 5.9)	BCQ (total score)	Significant group differences on BCQ: - ED > HC - BN > AN	N/A
		151 ED (inpatient sample): 76 AN; 27 BN; 48 EDNOS (mean BMI = 16.8, <i>SD</i> = 3.1)	EAT-40 (total score)		
		422 HC (university sample) (mean BMI = 20.4, <i>SD</i> = 2.2)		No significant differences between EDNOS and AN or BN groups	
6. Calugi et al. (2017)	Published	<i>N</i> = 248 (100% female)	BCQ (subscales and total score)	Significant group differences on BCQ: - AN > HC	N/A
		66 ED (inpatient sample): all AN (mean age = 26.1, <i>SD</i> = 5.9; mean BMI = 14.7, <i>SD</i> = 2.1)	EDE-Q (subscales and total score)		
		182 HC (community sample) (mean age = 24.9, <i>SD</i> = 5.6; BMI not reported)			
7. Kachani et al. (2013)*	Published	<i>N</i> = 125 (100% female)	BCCS (total score)	Significant group differences on BCCS: - ED > HC - AN > HC - BN > HC	Did not differentiate between body checking and body avoidance items on the BCAQ
		85 ED (outpatient sample): 44 AN; 41 BN (mean age and BMI not reported)	BCAQ (total score)		
			EAT-40 (total score)		
		40 HC (patient sample from Gynaecology Clinic of same hospital) (mean age and BMI not reported)		No significant differences between AN and BN	

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8. Kraus et al. (2015)	Published	<p><i>N</i> = 55 (100% female)</p> <p>26 ED (outpatient sample): 7 AN; 11 BN; 8 EDNOS (mean age = 26.92, <i>SD</i> = 7.63; mean BMI = 20.06, <i>SD</i> = 3.22)</p> <p>29 HC (university sample) (mean age = 24.00, <i>SD</i> = 3.90; mean BMI = 20.82, <i>SD</i> = 2.11)</p>	<p>BCQ (total score)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <ul style="list-style-type: none"> - ED > HC <p>Differences between ED subtypes not examined</p>	N/A
9. Legenbauer et al. (2017)*	Published	<p><i>N</i> = 422 (100% female)</p> <p>310 ED (outpatient sample): 71 AN; 178 BN; 30 BED; 31 EDNOS (mean age = 26.83, <i>SD</i> = 7.99; mean BMI = 22.40, <i>SD</i> = 6.14)</p> <p>112 HC (community sample) (mean age = 26.49, <i>SD</i> = 5.49; mean BMI = 21.91, <i>SD</i> = 0.95)</p>	<p>BCQ (total score)</p> <p>BIAQ (subscales and total score)</p> <p>EDE-Q (subscales)</p> <p>EDI-2 (drive for thinness and body dissatisfaction subscales)</p>	<p>Significant group differences on BCQ:</p> <ul style="list-style-type: none"> - ED > HC - AN > BED - BN > BED - AN > EDNOS 	<p>Significant group differences on BIAQ:</p> <ul style="list-style-type: none"> - ED > HC <p>No significant differences between ED subtypes</p>

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10. Lewer et al. (2016)*	Published	<i>N</i> = 59 (100% female)	BCQ (total score)	No significant group differences on BCQ between BED and HC	No significant group differences on BIAQ between BED and HC
		31 ED (outpatient and community sample): all BED (mean age = 43.94, <i>SD</i> = 10.06; mean BMI = 35.83, <i>SD</i> = 4.30)	BIAQ (total score)		
11. Mountford et al. (2006)*	Published	28 HC with obesity (outpatient and community sample) (mean age = 44.11, <i>SD</i> = 11.28; mean BMI = 37.29, <i>SD</i> = 4.26)	EDE-Q (weight and shape concern subscales only)	Significant group differences on BCQ: - ED > HC	N/A
			EDI-2 (subscales)		
		<i>N</i> = 289 (100% female);	BCQ (total score)	Differences between ED subtypes not examined	
		84 ED (inpatient sample): 12 AN; 29 BN; 43 EDNOS (mean age = 28.3, <i>SD</i> = 8.69; mean BMI = 22.1, <i>SD</i> = 6.72)	EDE-Q (subscales)		
		205 HC (university sample) (mean age = 22.4, <i>SD</i> = 8.69; mean BMI = 22.0, <i>SD</i> = 2.56)			

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12. Øverås et al. (2015)*	Published	<p><i>N</i> = 75 (100% female)</p> <p>30 ED (inpatient sample): all AN-R mean age = 19.07, <i>SD</i> = 2.96; BMI = not reported)(</p> <p>45 HC (school and university sample) (mean age = 18.31, <i>SD</i> = 3.14; BMI = not reported)</p>	<p>BCQ (total score)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <p>- AN > HC</p>	N/A
13. Reas et al. (2002)	Published	<p><i>N</i> = 165 (100% female)</p> <p>16 ED (outpatient sample): 4 AN; 9 BN; 3 EDNOS</p> <p>149 HC (university sample)</p> <p>(overall sample: mean age = 20.8, age range = 16-56; mean BMI = 22.1, range = 16.3-37.7)</p>	<p>BCQ (total score)</p> <p>EAT-26 (total score)</p>	<p>Significant group differences on BCQ:</p> <p>- ED > HC</p> <p>Differences between ED subtypes not examined</p>	N/A

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14. Rosen et al. (1991)*	Published	<i>N</i> = 45 (100% female)	BIAQ (total score)	N/A	Significant group differences on BIAQ: - BN > HC
		20 ED (outpatient sample): all BN (mean age = 24.65, <i>SD</i> = 6.5; mean BMI = not reported)	EDE-Q (weight and shape concern subscales only)		
		25 HC (community sample) (mean age = 27.61, <i>SD</i> = 3.6; mean BMI = not reported)			
15. Shafran et al. (2004)	Published	<i>N</i> = 110 (100% female)	BCAQ (total score)	Significant group differences on BCAQ: - ED > HC	Significant group differences on BCAQ: - ED > HC
		55 ED (inpatient sample): 14 AN (mean age = 24.8, <i>SD</i> = 6.9; mean BMI = 16.5, <i>SD</i> = 1.2); 12 BN (mean age = 25.2, <i>SD</i> = 4.0; mean BMI = 21.9, <i>SD</i> = 4.4); 29 EDNOS (mean age = 30.7, <i>SD</i> = 10.0; mean BMI = 21.1, <i>SD</i> = 3.5)	EDE-Q (total score)	No significant differences between ED subtypes	No significant differences between ED subtypes
		55 HC (community sample) (mean age = 28.5, <i>SD</i> = 8.5; mean BMI = 22.9, <i>SD</i> = 2.5)			
16. Shafran and Robinson (2004)	Published	<i>N</i> = 84 (100% female)	BCAQ (total score)	Significant group differences on BCAQ: - AN > HC - BN > HC - EDNOS > HC	Significant group differences on BCAQ: - AN > HC - BN > HC - EDNOS > HC
		42 ED (inpatient sample): 10 AN (mean age = 22.2, <i>SD</i> = 4.3; mean BMI = 16.7, <i>SD</i> = 0.8); 10 BN (mean age = 26.8, <i>SD</i> = 4.3; mean BMI = 24.2, <i>SD</i> = 6.2); 22 EDNOS (mean	EDE-Q (total score)	No significant differences between ED subtypes	No significant differences between ED subtypes

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age = 32.3, *SD* = 11.6; mean BMI = 23.0, *SD* = 7.3)

42 HC (community sample) (mean age = 28.3, *SD* = 9.1; mean BMI = 23.6, *SD* = 4.1)

17. Vocks et al. (2010)*	Published	<p><i>N</i> = 55 (100% female)</p> <p>28 ED (outpatient sample): 13 AN (mean age = 29.08, <i>SD</i> = 9.79, range = 18-49; mean BMI = 15.78, <i>SD</i> = 1.28, range = 12.92-17.38); 15 BN (mean age = 28.40, <i>SD</i> = 7.07, range = 20-42; mean BMI = 21.34, <i>SD</i> = 2.26, range = 17-68-24.44)</p> <p>27 HC (community sample) (mean age = 26.74, <i>SD</i> = 7.60, range = 19-50; mean BMI = 22.06, <i>SD</i> = 2.06, range = 17.95-26.74)</p>	<p>BIAQ (total score)</p> <p>EDE-Q (total score)</p> <p>EDI-2 (subscales)</p>	N/A	<p>Significant group differences on BIAQ:</p> <ul style="list-style-type: none"> - AN > HC - BN > HC <p>No significant differences between AN and BN</p>
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18. Vocks et al. (2009)	Published	<p><i>N</i> = 169 (100% female)</p> <p>62 ED (clinic waitlist (outpatient) sample): 16 AN; 21 BN; 25 EDNOS (mean age = 33.68, <i>SD</i> = 6.05; mean BMI = 19.30, <i>SD</i> = 2.68)</p> <p>107 HC (university and community sample) (mean age = 32.80, <i>SD</i> = 13.22; mean BMI = 22.75, <i>SD</i> = 4.08)</p>	<p>BCQ (total score)</p> <p>EDI (BD, drive for thinness and bulimia subscales only)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <p>- ED > HC</p> <p>Differences between ED subtypes not examined</p>	N/A
19. Waller et al. (2008)*	Published	<p><i>N</i> = 138 (100% female)</p> <p>68 ED (outpatient sample): 9 AN; 22 BN; 37 EDNOS (mean age = 28.6, <i>SD</i> = 8.70; mean BMI = 22.3, <i>SD</i> = 6.53)</p> <p>70 HC (university and community sample) (mean age = 23.2, <i>SD</i> = 4.18; mean BMI = 22.9, <i>SD</i> = 3.04)</p>	<p>BCQ (total score)</p> <p>EDE-Q (total score)</p>	<p>Significant group differences on BCQ:</p> <p>- ED > HC</p> <p>Differences between ED subtypes not examined</p>	N/A

Note. AN = Anorexia Nervosa; AN-BP = Anorexia Nervosa Binging/Purging Subtype; AN-R = Anorexia Nervosa Restricting Subtype; BA = Body Avoidance; BC = Body Checking; BCAQ = Body Checking and Avoidance Questionnaire; BCCS = Body Checking Cognitions Scale; BCQ = Body Checking Questionnaire; BD = Body Dissatisfaction; BED = Binge Eating Disorder; BIAQ = Body Image Avoidance Questionnaire; BMI = Body Mass Index; BN = Bulimia Nervosa; BRBS = Body-Related Behaviours Scale; EAT = Eating Attitudes Test; ED = Eating Disorder; EDE-Q = Eating Disorder Examination Questionnaire; EDI = Eating Disorder Inventory; EDNOS = Eating Disorder Not Otherwise Specified; HC = Healthy Controls; M = Mean; N/A = Not Applicable; OSFED = Other Specified Feeding and Eating Disorder; SD = Standard Deviation.

* = the study was included in the meta-analysis

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Table 2

Studies Investigating Body Checking and/or Body Avoidance in an Eating Disorder Sample (without a Control Group)

Author(s)	Publication status	Sample	Measure(s)	Body Checking Results	Body Avoidance Results
20. Breithaupt et al. (2014)	Published	<i>N</i> = 9 (100% female); inpatient sample 9 AN (age range = 14-17, <i>M</i> = 16.0, <i>SD</i> = 1.0; BMI range = 11.50-16.40, <i>M</i> = 13.89, <i>SD</i> = 1.77)	BCQ (total score) EDE-Q (total score)	AN subtypes were amalgamated and analysed as a single sample; therefore, differences between subtypes were not examined	N/A
21. Brytek-Matera (2009)	Published	<i>N</i> = 61 (100% female) 7 AN-R; 19 AN-BP; 35 BN (age range = 16-31, <i>M</i> = 21.69, <i>SD</i> = 3.85; BMI not reported)	BIAQ (total score) EDI (BD subscale)	N/A	ED subtypes were amalgamated and analysed as a single sample; therefore, differences between ED subtypes were not examined
22. Dakanalis, Carrà, et al. (2015)	Published	<i>N</i> = 801 (70 males & 731 females); outpatient sample 345 BN (319 females; mean age = 27.1, <i>SD</i> = 7.9; mean BMI = 23.8, <i>SD</i> = 7.9); 189 BED (170 females; mean age = 39.5, <i>SD</i> = 11.9; mean BMI = 34.4, <i>SD</i> = 12.4); 267 BT-	BCQ (total score) EDE-Q (dietary restraint subscale)	No significant group differences on BCQ between ED subtypes	N/A

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EDNOS (242 females;
mean age = 26.7, *SD* = 9.1;
mean BMI = 24.9, *SD* =
7.0)

23. Kachani et al. (2014)	Published	<i>N</i> = 85 (100% female); outpatient sample 44 AN (age range = 18-55, <i>M</i> = 28.2, <i>SD</i> = 8.5; BMI range = 11.9-26.4, <i>M</i> = 18.3, <i>SD</i> = 2.9); 41 BN (age range = 18-45, <i>M</i> = 27.5, <i>SD</i> = 7.3; BMI range = 15.2-40.5, <i>M</i> = 24.9, <i>SD</i> = 5.6)	BCAQ (BC items) EDE-Q (total score)	Significant group differences on BC subscale: - BN > AN	N/A
24. MacDonald et al. (2014)	Published	<i>N</i> = 171 (6 males & 165 females); inpatient sample 25 EDNOS; 146 BN (age range = 17-57, <i>M</i> = 26.2, <i>SD</i> = 8.2; BMI = not reported overall)	BCQ (total score) BIAQ (total score) EDI (total score)	No significant group differences on BCQ between ED subtypes	No significant group differences on BIAQ between ED subtypes
25. Morgan et al. (2014)	Published	<i>N</i> = 55 (2 males & 53 females); inpatient sample 37 AN-R; 18 AN-BP (age range = 18-42, <i>M</i> = 28.4; BMI range = 17.0-	BCQ (total score) BIAQ (total score) EDE-Q (subscales)	ED subtypes were amalgamated and analysed as a single sample; therefore, differences between ED subtypes were not examined	ED subtypes were amalgamated and analysed as a single sample; therefore, differences between ED subtypes were not examined

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20.3, *M* = 18.4)

26. Mountford et al. (2007)	Published	<p><i>N</i> = 84 (100% female); inpatient sample</p> <p>19 AN (mean age = 24.7, <i>SD</i> = 4.15; mean BMI = 16.2, <i>SD</i> = 1.37); 29 BN (mean age = 29.8, <i>SD</i> = 10.2; mean BMI = 22.0, <i>SD</i> = 3.52); 6 BED (mean age = 38.3, <i>SD</i> = 7.53; mean BMI = 39.6, <i>SD</i> = 3.52); 30 OSFED (mean age = 25.0, <i>SD</i> = 4.81; mean BMI = 20.2, <i>SD</i> = 3.00)</p>	<p>BCQ (subscales)</p> <p>EDE-Q (subscales)</p>	<p>Whilst BC scores were reported separately, differences between ED subtypes were not examined</p>	N/A
27. Mountford et al. (2015)	Published	<p><i>N</i> = 90 (2 males & 88 females); inpatient sample</p> <p>90 AN (mean age = 26.4, <i>SD</i> = 9.2; mean BMI = 15.5, <i>SD</i> = 1.8)</p>	<p>BCQ (total score)</p> <p>EDE-Q (subscales)</p>	<p>AN subtypes were amalgamated and analysed as a single sample; therefore, differences between subtypes were not examined</p>	N/A

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28. Reas et al. (2006)	Published	<i>N</i> = 73 (22 males & 51 females); treatment-seeking sample 73 BED (mean age = 45.0, <i>SD</i> = 9.8; mean BMI = 38.5, <i>SD</i> = 6.1)	BCQ (total score) EDE-Q (subscales)	This study examined body checking within only one ED subtype; therefore no comparisons could be made	N/A
29. Trottier, MacDonald, et al. (2015)	Published	<i>N</i> = 371 (100% female); outpatient sample 115 AN; 168 BN; 88 EDNOS (age range = 17-78, <i>M</i> = 26.8, <i>SD</i> = 4.2; BMI range = 13.2-44.9, <i>M</i> = 21.0, <i>SD</i> = 4.2)	BCQ (total score) BIAQ (subscales) EDI (BD subscale)	ED subtypes were amalgamated and analysed as a single sample; therefore, differences between ED subtypes were not examined	ED subtypes were amalgamated and analysed as a single sample; therefore, differences between ED subtypes were not examined
30. Vossbeck-Elsebusch et al. (2015)	Published	<i>N</i> = 78 (100% female); outpatient sample 31 BN; 47 EDNOS (age range = 17-56, <i>M</i> = 31.49, <i>SD</i> = 9.39; BMI range = 16.26-59.86, <i>M</i> = 30.71, <i>SD</i> = 11.97)	BIAQ (subscales) EDE-Q (subscales)	N/A	Although BIAQ scores were reported separately, differences between ED subtypes were not examined

Note. AN = Anorexia Nervosa; AN-BP = Anorexia Nervosa Binge/Purging Subtype; AN-R = Anorexia Nervosa Restricting Subtype; BC = Body Checking; BCAQ = Body Checking and Avoidance Questionnaire; BCQ = Body Checking Questionnaire; BD = Body Dissatisfaction; BED = Binge Eating Disorder; BIAQ = Body Image Avoidance Questionnaire; BMI = Body Mass Index; BN = Bulimia Nervosa; BT-EDNOS = Bulimic-Type Eating Disorder Not Otherwise Specified; EAT = Eating Attitudes Test; ED = Eating Disorder; EDE-Q = Eating Disorder Examination Questionnaire; EDI = Eating Disorder Inventory; EDNOS = Eating Disorder Not Otherwise Specified; *M* = Mean; N/A = Not Applicable; OSFED = Other Specified Feeding and Eating Disorder; *SD* = Standard Deviation.

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Table 3

Studies Investigating Body Checking and/or Body Avoidance in a Nonclinical Population

Author(s)	Publication status	Sample	Measure(s)	Body Checking Results	Body Avoidance Results
31. Alperin et al. (2014)*	Published	<i>N</i> = 1176; community sample 635 males & 541 females (age range = 19-91, <i>M</i> = 28.41, <i>SD</i> = 8.84; BMI range = 13.21-60.47, <i>M</i> = 25.85, <i>SD</i> = 6.28)	BCQ (total score and subscales) EDI (drive for thinness subscale)	Significant positive correlations between the BCQ (total score and all subscales) and the drive for thinness subscale of the EDI	N/A
32. Bailey and Waller (2017)*	Published	<i>N</i> = 50; university students/staff 100% female (demographic data reported for 33 participants: age range = 19-72, <i>M</i> = 35.8, <i>SD</i> = 15.19; mean BMI = 24.8, <i>SD</i> = 4.93)	BCQ (total score) EDE-Q (total score and all subscales)	Significant positive correlations between the BCQ and all subscales of the EDE-Q	N/A
33. Carmona et al. (2015)*	Published	<i>N</i> = 1786; high-school students 912 males & 874 females (age range = 12-16, <i>M</i> = 14.00, <i>SD</i> = 1.41; mean BMI = 21.43, <i>SD</i> = 3.67)	BIAQ (total score and all subscales) 13-FS (total score)	N/A	Significant positive correlations between the BIAQ (total score and all subscales) and body dissatisfaction (as measured by the 13-FS)

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34. Chang (2014)*	Unpublished	<i>N</i> = 212; undergraduate students 100% female (mean age = 21.06, <i>SD</i> = 3.92; mean BMI = 24.22, <i>SD</i> = 4.49)	BCQ (total score) EDE-Q (all subscales) EDI-2 (body dissatisfaction, bulimia, and drive for thinness subscales)	Significant positive correlations between the BCQ, all subscales of the EDE-Q, and all three subscales of the EDI-2	N/A
35. Dakanalis, Favagrossa, et al. (2015)	Published	<i>N</i> = 551; university students 100% male (age range = 18-28, <i>M</i> = 20.82, <i>SD</i> = 4.43; BMI = not reported)	MBCQ (total score) EDI (bulimic behaviours and BD subscales)	Significant positive correlations between the MBCQ and both subscales of the EDI	N/A
36. De Berardis et al. (2007)*	Published	<i>N</i> = 254; university students 100% female (age range = 18-30, <i>M</i> = 22.5, <i>SD</i> = 1.9; BMI range = 17.3-31.1, <i>M</i> = 21.2, <i>SD</i> = 2.6)	BCQ (total score) EAT-26 (total score)	Significant positive correlations between the BCQ and the EAT-26	N/A
37. Engle (2009)*	Unpublished	<i>N</i> = 645; university students 100% female (age range = 17-51, <i>M</i> = 20.9, <i>SD</i> = 4.4; mean BMI = 24.1)	BICAS (checking subscale) BIAS EAT-26	Significant positive correlation between the BICAS checking subscale and the EAT-26	Significant positive correlation between the BIAS and the EAT-26

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38. Hildebrandt et al. (2010)*	Published	<i>N</i> = 342; university students 196 males & 146 females (mean age = 19.76, <i>SD</i> = 2.78; mean BMI (males) = 24.74, <i>SD</i> = 3.71; mean BMI (females) = 22.8, <i>SD</i> = 3.45)	MBCQ (total score) EDE-Q (all subscales)	Significant positive correlations between the MBCQ and all subscales of the EDE-Q	N/A
39. Jansen et al. (2016)*	Published	<i>N</i> = 22; university students 100% female (age range = 18-23, <i>M</i> = 19.8, <i>SD</i> = 1.5; BMI range = 18-29, <i>M</i> = 23.5, <i>SD</i> = 2.4)	BCQ (total score) BIAQ (subscales) EDE-Q (subscales)	No significant correlations between the BCQ (total score and all subscales) and the shape concern subscale of the EDE-Q	No significant correlations between the BIAQ (total score and all subscales) and the shape concern subscale of the EDE-Q
40. Latner et al. (2012)*	Published	<i>N</i> = 214; community sample 100% female (mean age = 26.30, <i>SD</i> = 8.98; mean BMI = 21.58, <i>SD</i> = 7.28)	BCQ (total score) BIAQ (total score) EDE-Q (subscales)	Significant positive correlations between the BCQ and all subscales of the EDE-Q	Significant positive correlations between the BIAQ and all subscales of the EDE-Q
41. Luethcke et al. (2011)*	Published	<i>N</i> = 168; university students 100% female (demographic data reported for 153 participants: age range = 17-21, <i>M</i> = 18.45, <i>SD</i> = 0.78; BMI = not reported)	BCQ (subscales) BIAQ (subscales) EDE-Q (subscales)	Significant positive correlations between all BCQ subscales, and both the shape concern and weight concern subscales of the EDE-Q	Significant positive correlations between all BIAQ subscales, and both the shape concern and weight concern subscales of the EDE-Q

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42. Maïano et al. (2009)*	Published	<i>N</i> = 106; high-school students 69 males & 37 females (age range = 11-18, <i>M</i> = 14.90, <i>SD</i> = 2.29; BMI = not reported)	BIAQ (total score and subscales) EAT-26 (total score)	N/A	Significant positive correlations between the BIAQ (total score and all subscales) and the EAT-26
43. McLean et al. (2011)	Published	<i>N</i> = 61; community sample 100% female (mean age = 45.4, <i>SD</i> = 8.4; mean BMI = 30.75, <i>SD</i> = 7.2)	BIAQ (social activities and clothing subscales only) EDE-Q (subscales)	N/A	Significant positive correlations between both BIAQ subscales, and the combined weight/shape concern subscale of the EDE-Q
44. Meyer et al. (2011)*	Published	<i>N</i> = 250; university students 88 males & 162 females (mean age (males) = 25.5, <i>SD</i> = 7.55; mean age (females) = 24.0, <i>SD</i> = 7.86; mean BMI (males) = 24.3; mean BMI (females) = 22.5)	BRBS (BC & BA subscales) EDE-Q (subscales)	Significant positive correlations between the BC subscale and all four subscales of the EDE-Q	Significant positive correlations between the BA subscales and all four subscales of the EDE-Q
45. Pellizzer et al. (2017)*	Published	<i>N</i> = 328; university students 100% female (mean age = 19.74, <i>SD</i> = 2.13; mean BMI = 23.00, <i>SD</i> = 4.77, range = 14.69-59.99)	BCQ (total score and subscales) BIAQ (total score and subscales) EDI (BD subscale) EDE-Q (total score)	Significant positive correlations between the BCQ subscales and EDE-Q, and the body dissatisfaction subscale of the EDI	Significant positive correlations between the BIAQ subscales, and the EDE-Q, and the body dissatisfaction subscale of the EDI

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46. Rodgers et al. (2013)*	Published	<i>N</i> = 431; community sample 139 males & 292 females (age range = 19-35, <i>M</i> = 25.20, <i>SD</i> = 4.25; mean BMI (males) = 23.00, <i>SD</i> = 3.52; mean BMI (females) = 22.08, <i>SD</i> = 3.92)	BIAQ (subscales) EAT-26 (total score and subscales)	N/A	Significant positive correlations between all subscales of the BIAQ, and the EAT-26 (total score and all three subscales)
47. Trautmann et al. (2007)	Published	<i>N</i> = 540; university students 100% female (mean age = 19.72, <i>SD</i> = 2.36; mean BMI = 22.79, <i>SD</i> = not reported)	BIAQ (clothing subscale only) EDI (BD subscale)	N/A	Significant positive correlation between the clothing subscale of the BIAQ, and the BD subscale of the EDI
48. Vartanian and Grisham (2012)*	Published	<i>N</i> = 303; university students 167 males & 136 females (mean age (males) = 26.27, <i>SD</i> = 10.70; mean age (females) = 24.64, <i>SD</i> = 9.57; mean BMI (males) = 23.91, <i>SD</i> = 3.70; mean BMI (females) = 22.35, <i>SD</i> = 3.34)	BCQ (total score) EDI (BD subscale)	Significant positive correlation between the BCQ and the BD subscale of the EDI	N/A
49. Walker et al. (2009)	Published	<i>N</i> = 550; university students 100% male (age range = 16-30, <i>M</i> = 18.98, <i>SD</i> = 1.59; mean BMI = 24.7, <i>SD</i> = 4.4)	MBCQ (total score) EDE-Q (shape and weight concern subscales only)	Significant positive correlation between the MBCQ and the combined shape/weight concern subscale of the EDE-Q	N/A

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50. White (2013)*	Unpublished	<i>N</i> = 904; university students 337 males & 567 females (mean age = 20.46, <i>SD</i> = 4.26); mean BMI = 24.19, <i>SD</i> = 5.21)	BCQ (total score)	Significant positive correlations between the total score of the EDE-Q and the BCQ (females), MBCQ (males), and BCCS (both males & females)	N/A
			MBCQ (total score)		
			BCCS (total score)		
			EDE-Q (total score)		
51. White and Warren (2013)	Published	<i>N</i> = 650; university students 100% female (age range = 18-32, <i>M</i> = 19.64, <i>SD</i> = 2.23; BMI range = 14.44-41.01, <i>M</i> = 22.41, <i>SD</i> = 4.13)	BCQ (subscales)	Significant positive correlations between all BCQ subscales and the total score of the EDE-Q	N/A
			EDE-Q (total score)		
52. White et al. (2015)*	Published	<i>N</i> = 1013; university students 100% female (age range = 18-55, <i>M</i> = 20.61, <i>SD</i> = 4.80; BMI range = 14.50-41.01, <i>M</i> = 22.91, <i>SD</i> = 4.39)	BCQ (total score)	Significant positive correlations between the BCQ and all four subscales of the EDE-Q	N/A
			EDE-Q (subscales)		

Note. 13-FS = 13 Figure Scale; BA = Body Avoidance; BC = Body Checking; BCAQ = Body Checking and Avoidance Questionnaire; BCCS = Body Checking Cognitions Scale; BCQ = Body Checking Questionnaire; BD = Body Dissatisfaction; BIAQ = Body Image Avoidance Questionnaire; BICAS = Body-Image Compulsive Actions Scale; BIAS = Body-Image Avoidance Scale; BMI = Body Mass Index; BRBS = Body-Related Behaviours Scale; EAT = Eating Attitudes Test; EDE-Q = Eating Disorder Examination Questionnaire; EDI = Eating Disorder Inventory; M = Mean; MBCQ = Male Body Checking Questionnaire; N/A = Not Applicable; SD = Standard Deviation. * = *the study was included in the meta-analysis.*

Figure legends

Figure 1. PRISMA Flow Chart of systematic review and meta-analysis selection process.

Figure 2. Forest plots of (a) body checking in eating disorders versus healthy controls, and (b) body avoidance in eating disorders versus healthy controls, including effect sizes (Cohen's d) and confidence intervals (CI) for effect sizes for group comparisons. The overall effect sizes for the random-effects meta-analyses for eating disorder subtypes and eating disorders overall are represented by black diamonds. AN = Anorexia Nervosa; BED = Binge Eating Disorder; BN = Bulimia Nervosa; EDNOS = Eating Disorder Not Otherwise Specified; OSFED = Other Specified Feeding or Eating Disorder.

Figure 3. Forest plots of (a) body checking and eating disorder pathology in nonclinical samples, and (b) body avoidance and eating disorder pathology in nonclinical samples, including effect sizes (r) and confidence intervals (CI) for effect sizes. The overall effect sizes for the random-effects meta-analyses for eating pathology behaviours and eating pathology overall are represented by black diamonds. ED = Eating Disorders.

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BODY CHECKING AND BODY AVOIDANCE

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Author/s:

Nikodijevic, A;Buck, K;Fuller-Tyszkiewicz, M;de Paoli, T;Krug, I

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