



Predictors of outcome in cognitive behavioural therapy for eating disorders: An exploratory study



Mia L. Pellizzer^{a,*,1}, Glenn Waller^b, Tracey D. Wade^a

^a College of Education Psychology & Social Work, Flinders University, Adelaide, South Australia, Australia

^b Department of Psychology, University of Sheffield, United Kingdom

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ABSTRACT

Objective: Early decrease in symptoms is a consistent predictor of good treatment outcome across all eating disorders. The current study explored the predictive value of novel early change variables in a transdiagnostic, non-underweight sample receiving 10-session cognitive behavioural therapy.

Method: Participants who reported bingeing and/or purging in the week preceding baseline assessment ($N = 62$) were included in analyses. Early change variables were calculated for novel (body image flexibility, body image avoidance, body checking, and fear of compassion) and established predictors (behavioural symptoms and therapeutic alliance). Outcomes were global eating disorder psychopathology and clinical impairment at post-treatment and three-month follow-up. Intent-to-treat analyses were conducted using linear regression, adjusting for baseline values of the relevant outcome and early change in behavioural symptoms.

Results: Early improvement in body image flexibility was the most consistent predictor of good outcome. Early change in body image avoidance and the fear of expressing and receiving compassion to/from others were significant predictors in some analyses.

Discussion: Novel early change variables were significant predictors of eating disorder outcomes in this exploratory study. Model testing is required to understand the exact mechanisms by which these variables impact on outcomes, and whether there is potential benefit of modifying existing protocols.

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Early symptom change is the most robust and consistent predictor of outcome across all eating disorders (Linardon, de la Piedad Garcia, & Brennan, 2017; Vall & Wade, 2015). Specifically, early reductions in eating disorder symptoms such as binge eating, purging, dietary restraint, and global eating disorder psychopathology are considered to predict later change in outcomes related to eating disorder psychopathology, bulimic behaviours, and general psychopathology, at both end of treatment and follow-up. Thus, a focus on early change in eating disorder treatment has been encouraged, particularly through the use of behavioural techniques such as the use of homework tasks and self-monitoring, as in cognitive behavioural therapy (CBT; Linardon, Brennan, & de la Piedad Garcia, 2016).

Early change in therapeutic alliance also has a small but significant relationship with eating disorder symptom change (Graves et al., 2017), albeit early symptom change has a stronger impact on predicting subsequent alliance, and early symptom change partially accounts for the relationship between early alliance and outcome (Graves et al., 2017).

Beyond early change in symptoms and therapeutic alliance, exploration of additional early change predictors has been limited. Thus far, there is emerging evidence for early improvements in body image (Cavallini & Spangler, 2013; Danielsen & Rø, 2012; Spangler, Baldwin, & Agras, 2004; Turner, Bryant-Waugh, & Marshall, 2015), shame and self-compassion (Kelly, Carter, & Borairi, 2014), and emotion regulation (MacDonald, Trottier, & Olmsted, 2017; Peterson et al., 2017) predicting improvements in eating disorder psychopathology at post-treatment. However, available studies typically do not control for early symptom change.

In this exploratory study, we examine the potential predictive roles of early change in two other domains – other aspects of body image, and compassion. Three aspects of body image will be considered. The first is body image flexibility - the ability to accept and experience both positive and negative body-related thoughts and feelings, and to act on limiting the degree to which weight, body and appearance influence one's life (Sandoz, Wilson, Merwin, & Kellum, 2013). Body image

* Corresponding author. Headspace Onkaparinga, Unit 3, 50 Esplanade, Christies Beach, SA, 5165, Australia.

E-mail address: mia-liane@hotmail.com (M.L. Pellizzer).

¹ Present address: Headspace Onkaparinga, Christies Beach, South Australia.

flexibility has been explored as a predictor and moderator of eating disorder symptoms in non-clinical samples (Ferreira, Pinto-Gouveia, & Duarte, 2011; Hill, Masuda, & Lutzman, 2013; Moore, Masuda, Hill, & Goodnight, 2014; Pellizzer, Tiggemann, Waller, & Wade, 2018; Sandoz et al., 2013) and is considered to be an aspect of positive body image, distinct from negative body image, that is a protective factor for physical and psychological wellbeing (Tylka & Wood-Barcalow, 2015; Webb, Wood-Barcalow, & Tylka, 2015). Early improvements in body image flexibility in residential treatment are associated with greater reductions in eating disorder symptoms, quality of life, and general mental health (Butryn et al., 2013; Lee, Ong, Twohig, Lensegrav-Benson, & Quakenbush-Roberts, 2018). However, body image flexibility has not yet been explored as an early change variable in outpatient treatment. We are also interested in body image avoidance and body checking - two behavioural manifestations of body image disturbance that are routinely targeted in cognitive behaviour therapy for eating disorders (CBT-ED), and which (in contrast to body image flexibility) are considered risk and maintenance factors for eating disorders (Amin, Strauss, & Waller, 2012). Pellizzer, Waller, and Wade (2018a) recently found body image flexibility and avoidance to be significant predictors and moderators of global eating disorder psychopathology, while body checking was a significant baseline predictor.

Despite growing interest, compassion and fear of compassion have seldom been explored in eating disorder samples. Kelly et al. (2014) found early change in self-compassion (the ability to express kindness and acceptance to one's self) to be a significant predictor of post-treatment eating disorder symptoms in an inpatient and day hospital sample. In another study using a similar sample, Kelly, Carter, Zuroff, and Borairi (2013) found both self-compassion and the fear of self-compassion to be simple baseline predictors as well as interacting to predict post-treatment eating disorder symptoms (as measured by the Eating Disorder Examination Questionnaire [EDE-Q] global score). At baseline, those participants with both high fear of self-compassion and low self-compassion, had higher levels of shame and eating disorder psychopathology (Kelly et al., 2013). Furthermore, participants with this presentation were found to have a significantly poorer response to treatment, showing little improvement in shame and eating disorder psychopathology at the end of treatment. Results from treatment studies are consistent with a recent systematic review of 28 clinical and non-clinical studies that found self-compassion to be protective against negative body image and eating disorder psychopathology (Braun, Park, & Gorin, 2016).

Kelly et al. (2013) assessed the fear of self-compassion using a subscale from the Fears of Compassion Scales developed by Gilbert, McEwan, Matos, and Ravis (2011) following clinical observation that some experience difficulty in expressing and receiving compassion to the self and others. To our knowledge, early change in fear of expressing compassion to others and fear of receiving compassion from others are yet to be explored as predictors of outcome in eating disorder samples. However, some recent work has included subscales as simple predictors. Kelly, Wisniewski, Martin-Wager, and Hoffman (2017) compared a treatment as usual (TAU) group (mostly CBT-ED and dialectical behaviour therapy) with TAU with a group-based compassion-focused therapy as an adjunct. The fear of receiving compassion and fear of self-compassion were both found to significantly improve at post-treatment for the TAU + compassion group only. The fear of expressing compassion to others was not examined. However, another recent non-clinical study with a community sample of women found the fear of expressing compassion had a direct impact on disordered eating while the fear of receiving compassion from others and fear of self-compassion had a partial impact on disordered eating via the constructs of social safeness and body shame (Dias, Ferreira, & Trindade, 2018, pp. 1–8). Research is limited, although it appears that self-compassion is protective against eating disorder psychopathology while the fear of compassion contributes to poorer outcomes, perhaps due to the connection to shame (Kelly et al., 2013).

The aim of the present study is to explore novel early change variables (aspects of body image and fear of compassion) as predictors of eating disorder treatment outcomes at post-treatment and three-month follow-up (global eating disorder psychopathology and clinical impairment). This is achieved using an adult transdiagnostic non-underweight sample who received ten-session CBT for eating disorders (CBT-T; Waller et al., 2018). CBT-T (Waller et al., 2018) is a briefer, manualised therapy that addresses the key elements of CBT-ED such as collaborative weighing, regular eating, and body image work (Fairburn, 2008; Waller et al., 2007). Readers are directed to Waller et al. (2018) for further information regarding this therapy. To adjust for its effect, early symptom change in behaviours was included in each model as a covariate, while therapeutic alliance was included as an established predictor. As the present study is exploratory in nature, hypothesis testing is not appropriate.

1. Method

1.1. Participants

Participants in the present study were drawn from a transdiagnostic treatment-seeking eating disorder sample with a body mass index (BMI) > 17.5 (see Fig. 1), previously described by Pellizzer, Waller, et al. (2018a). To assess early change variables after adjusting for early behavioural change, only those participants who started treatment and reported behaviours (i.e., objective binges and/or purging) in the week preceding baseline assessment were included ($N = 63$, aged ≥ 15 years). This approach is similar to MacDonald et al. (2017), where only those participants with Bulimia Nervosa (BN) and Purging Disorder were included. One participant was excluded from analyses as data were missing for behavioural variables, leaving a final sample of 62 with a mean age of 27.37 years ($SD = 9.77$; range 15.69–68.97), and a mean BMI of 27.79 ($SD = 8.40$; range 18.20–52.40). Most were women (91.9%) and Caucasian (87.1%). The majority of the sample met DSM-5 criteria (American Psychiatric Association, 2013) for Bulimia Nervosa (BN). Other Specified Feeding and Eating Disorders (OSFED) was the second most common diagnosis, typically BN of low frequency/limited duration (see Fig. 1).

A sample size analysis was completed to determine the number of participants required for sufficient power. The meta-analysis completed by Vall and Wade (2015) found a mean effect size, provided as a correlation coefficient, of 0.51, for the contribution of early change to outcome. Using this correlation, a sample size of 62 was considered sufficient with a 95% confidence interval 0.30–0.67 (Wilson, 2018). Thus, the study is adequately powered.

1.2. Measures

Measures were completed at baseline (assessment session), mid-treatment (session four), post-treatment (session 10), and after three-month follow-up.

Weight and frequency of disordered eating. Collaborative, open weighing occurred at each session as part of the therapy. We used daily food intake diaries to obtain the frequency of disordered eating behaviours (objective binges, vomiting, and laxative abuse) and confirmed frequencies during session. Clinician judgement was also used to distinguish subjective and objective binges. Behaviours were recorded in this way, rather than the EDE-Q, to ensure accuracy and reflect current behaviour. For the present study, we created a total behaviour score at each time point by summing reported behaviours.

Global eating disorder psychopathology. The global score from the Eating Disorder Examination – Questionnaire (EDE-Q) assesses eating disorder psychopathology over the previous 28 days (Fairburn & Beglin, 2008), using 22 items rated on a 7-point Likert scale (Fairburn & Beglin, 2008). Higher scores indicate greater eating disorder psychopathology. The EDE-Q global score has good reliability and is correlated

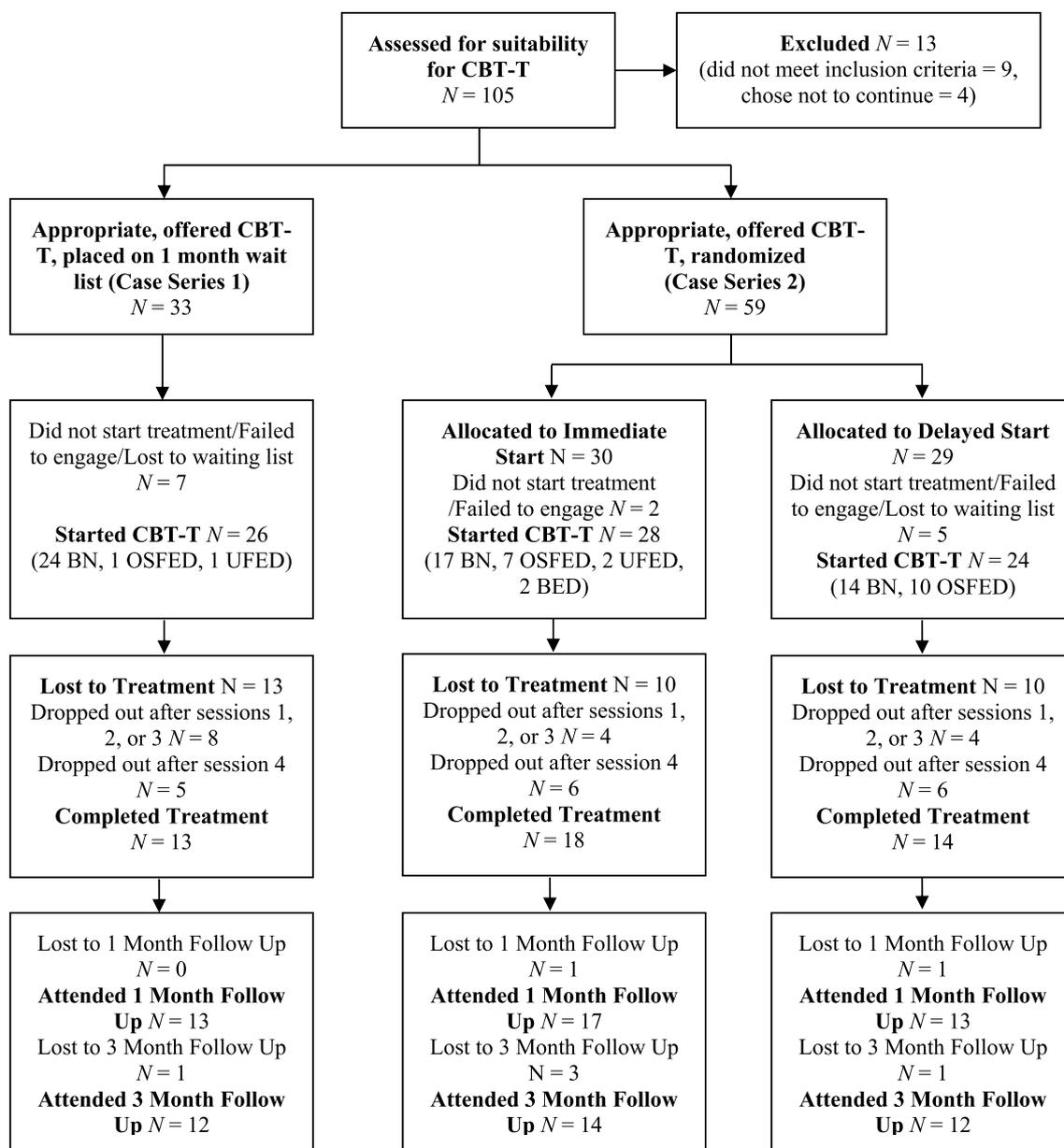


Fig. 1. CONSORT diagram.

Note. Original sample.

BN = Bulimia Nervosa, OSFED = Other Specified Feeding and Eating Disorder, UFED = Unspecified Feeding and Eating Disorder, BED = Binge Eating Disorder. OSFED diagnoses: 13 BN Low Frequency/Limited Duration, 5 Atypical Anorexia Nervosa.

with other measures of disordered eating (Berg, Peterson, Frazier, & Crow, 2012; Kelly et al., 2013; Mond, Hay, Rodgers, & Owen, 2006) Internal consistency in the present study was 0.89.

Clinical Impairment. The Clinical Impairment Assessment (CIA; Bohn et al., 2008; Bohn & Fairburn, 2008) assesses psychosocial impairment caused by disordered eating using 16 items, rated on a 4-point Likert scale. The higher the sum of the items, the greater the impairment. The CIA demonstrates good psychometric properties (Bohn et al., 2008). In the current study internal consistency was 0.88.

Body image flexibility. The unidimensional 12-item Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) measures the ability to accept and act on limiting the degree to which weight, body and appearance influences life, including mood, self-evaluation, control over life, use of time, and relationships. Items (e.g. “To control my life, I need to control my weight”) are rated on a 7-point Likert scale, reverse scored and summed (Sandoz et al., 2013). Higher

scores indicate greater body image flexibility. The scale has strong reliability, is correlated with a range of measures including disordered eating, body image, and general psychopathology, and differentiates between eating disorder, dieting, ‘at risk’ and comparison groups (Pellizzer et al., 2018). Internal consistency in the current study was 0.90.

Body image avoidance. The Body Image Avoidance Questionnaire (BIAQ; Rosen, Srebnik, Saltzberg, & Wendt, 1991) assesses the avoidance of body image related situations (e.g. “I do not go out socially if the people I am with are thinner than me”). The response format was changed in the present study from a 6-point to 7-point Likert scale to match that of the BI-AAQ. This response format was recently validated (Pellizzer et al., 2018). Scores are summed and higher scores indicate greater avoidance. The original questionnaire contained 19 items and four factors (Rosen et al., 1991). However, factor structure and psychometric properties have been inconsistent across studies (see

Pellizzer et al., 2018). Using confirmatory factor analysis, a 14-item two-factor solution (Lydecker, Cotter, & Mazzeo, 2014) was recently found to have superior fit indices compared to other models (Pellizzer et al., 2018). Thus, the total score from the 14-item model was used in the present study, yielding adequate internal consistency ($\alpha = 0.90$). The BIAQ is correlated with measures of eating disorder psychopathology, body image, and self-esteem, and participants with bulimia nervosa had greater scores compared to controls (Maiano, Morin, Monthuy-Blanc, & Garbarino, 2009; Rosen et al., 1991).

Body checking. The Body Checking Questionnaire (BCQ; Reas, Whisenhunt, Netemeyer, & Williamson, 2002) is a 23-item 3-factor measure of body checking behaviours (e.g. “I check the diameter of my wrist”). The response format has been changed from a 5-point to 7-point Likert Scale in the present study to match the BI-AAQ and BIAQ, consistent with a recent study that ensured identical response format to enable confirmatory factor analysis using all three measures (Pellizzer et al., 2018). Scores are summed and higher scores indicate greater body checking. Like the BIAQ, varying factor structures have been found and thus psychometric properties have been inconsistent (see Pellizzer et al., 2018). However, when several models were compared, the original factor structure was found to be comparable to other proposed models (see Pellizzer et al., 2018). Thus, the original model was retained and the total score only is reported for simplicity. Internal consistency in the present study was 0.97. The BCQ is correlated with several variables, including eating disorder psychopathology, body image, and general psychopathology. Scores are higher in clinical and dieting samples (see Pellizzer et al., 2018).

Fears of compassion. The Fears of Compassion Scales (FCS; Gilbert et al., 2011) consist of three subscales - fear of expressing compassion for others (e.g. “People will take advantage of me if they see me as too compassionate”), fear of receiving compassion from others (e.g. “Wanting others to be kind to oneself is a weakness”), and fear of self-compassion (e.g. “I feel that I don't deserve to be kind and forgiving to myself”) - totalling 38 items. Items are rated on a 5-point Likert scale and are summed to calculate total scores for each subscale (Gilbert et al., 2011). Higher scores indicate a greater fear of compassion. The subscales have good internal consistency and are correlated with measures of self-coldness, self-criticism, insecure attachment, depression, anxiety, and stress (Gilbert et al., 2011). Internal consistency in the present study was 0.88–0.92.

Working alliance. The 12 item Working Alliance Inventory – Short Revised (WAI-SR; Hatcher & Gillaspay, 2006), based on the original Working Alliance Inventory (WAI; Horvath & Greenberg, 1989), assesses the quality of therapeutic alliance. A 7-point Likert scale is used to rate each item and an average across all items provides a total, where higher scores indicate greater working alliance. The scale has good internal consistency, correlates well with the original WAI and other measures of working alliance (Hatcher & Gillaspay, 2006). In addition, the WAI has good predictive validity (Horvath & Greenberg, 1989). The measure was administered at session one (rather than baseline) and exhibited good internal reliability ($\alpha = 0.93$).

1.3. Procedure

The procedure has been previously reported (Pellizzer, Waller, et al., 2018a) and thus only brief details are provided here. Following approval by the Institutional Research Ethics Committee, participants were recruited from consecutive referrals to the Flinders University Services for Eating Disorders (FUSED) outpatient clinic after giving informed consent. Diagnosis, using DSM-5 criteria (American Psychiatric Association, 2013), was assessed at baseline interview using a standardised outline of the issues to be covered (Wade & Pellizzer, 2018) - i.e., information regarding pertinent diagnostic features such as current eating, compensatory behaviours, body image disturbance. Self-report measures, such as the EDE-Q and CIA, supplemented information collected via clinical interviewing. Diagnosis was discussed and

confirmed in supervision. Each participant received one session per week of therapy for ten weeks (CBT-T; Waller et al., 2018) delivered by seven trainee psychologists (postgraduate clinical psychology students), who received weekly or bi-weekly supervision by two authors (GW and TW). A review of progress is completed at session 4. Participants are aware that initially they will only be offered four sessions with an extension to ten contingent upon demonstration of progress and active engagement in therapy tasks (Waller et al., 2018). Specifically, by session 4, participants are required to engage in daily food intake monitoring, collaborative weighing, increased regularity and adequacy of food intake, read any psychoeducational material and any other tasks set for homework (Waller et al., 2018).

1.4. Statistical analyses

The majority of analyses were conducted using Mplus version 7.31 (Muthén & Muthén, 1998–2017). Data cleaning, demographic information, and descriptive statistics were performed using SPSS version 22 (IBM Corp, 2013). Little's Missing at Random (MAR) test was used to assess whether data were missing at random. As > 5% of data were missing, multiple imputation using Bayesian analysis (Muthén & Muthén, 1998–2017) was performed for predictors and outcomes of interest. Ten imputed data sets were specified and resulting parameter estimates and standard errors were averaged across the ten sets of analyses. Imputed data sets were merged and averaged to perform descriptive statistics in SPSS.

We used linear regression to explore whether early change (at the fourth treatment session) predicted changes in global eating disorder psychopathology and clinical impairment at posttreatment and three-month follow-up. We calculated change scores for each predictor of interest, and included change in binge/purge behaviours between baseline and session four as a covariate, as per previous methodology (MacDonald et al., 2017). To aid interpretation, difference scores were calculated such that positive values indicate improvements in the desired direction. The outcome variable was either global eating disorder psychopathology or clinical impairment at posttreatment or follow-up, with the appropriate baseline value included as a covariate. We examined seven predictors: body image flexibility, body image avoidance, body checking, fear of expressing compassion for others, fear of receiving compassion from others, fear of self-compassion, and working alliance.

Analyses were all completed using an intent to treat (ITT) sample. A total of 28 models were run (two outcome variables, seven predictors, and two time points). For each model we present the estimate, standard error, and significance value for the baseline value of the outcome variable, early behaviour change, and early change for the predictor variable. Hence we are able to examine each predictor of interest after adjusting for early behaviour change. In addition, we performed supplementary analyses by rerunning analyses sequentially to assess the impact of age and duration of eating disorder as covariates. Bonferroni's correction was applied for multiple comparisons (using an alpha of .007). Estimates, representing linear regression coefficients, demonstrate the resulting change in the outcome variable of interest per every 1 unit change in the predictor variable.

2. Results

2.1. Preliminary analyses

Data were first checked for normality to ensure the suitability of parametric tests, using visual inspection of distributions and formal inference tests (Tabachnick and Fidell (2012)). Some variables were not normally distributed, including EDE-Q (baseline only), CIA (follow-up only), and change scores for behaviours, body image flexibility, fear of self-compassion, and working alliance. To aid interpretation, transformations were not performed given the majority of variables correspond

Table 1
Means (standard deviations) for outcomes and change variables (ITT, N = 62).

Outcomes	Baseline	Post-treatment	3-month FU
EDE-Q	4.08 (0.98)	1.71 (1.01)	1.57 (0.94)
CIA Baseline	31.98 (8.31)	11.88 (7.45)	10.32 (9.04)

	Baseline	Change
Behaviour	9.05 (10.83)	6.63 (6.63)
Body Image Flexibility	29.84 (11.53)	9.92 (10.95)
Body Image Avoidance	53.96 (16.80)	7.83 (9.95)
Body Checking	89.57 (29.66)	17.83 (17.76)
Fear of Expressing Compassion	17.86 (8.71)	0.36 (6.64)
Fear of Receiving Compassion	21.80 (11.88)	2.64 (7.71)
Fear of Self-Compassion	27.98 (14.40)	3.87 (9.06)
Working Alliance	6.22 (0.79)	0.37 (0.59)

Note. EDE-Q = Eating Disorder Examination Questionnaire Global; CIA = Clinical Impairment Assessment.

to meaningful values (Tabachnick & Fidell, 2012). Prior to imputing missing data, Little's missing completely at random test (considering all variables used in analyses) was non-significant $\chi^2(60) = 50.15, p = .81$, indicating that data were missing at random.

Table 1 provides the means and standard deviations for each outcome, predictor at baseline, and predictor change scores. Working alliance change ($M = 0.37, SD = 0.59$) was low. However, strong alliance was observed at the first treatment session ($M = 6.22, SD = 0.79$), thus limiting the potential for substantial change.

2.2. Global eating disorder psychopathology

Table 2 presents the estimates and standard errors for early change models at post-treatment and three-month follow-up. At post-treatment, two change variables were significant predictors of global eating disorder psychopathology - body image flexibility and the fear of expressing compassion. Body image avoidance, body checking, and the fear of receiving compassion approached significance. At three-month follow-up, only body image flexibility remained a significant predictor. However, the fear of expressing compassion was nearing significance. Behaviour change was not significant in any model, and nor was working alliance. Age and disorder duration were not significant and did not change the pattern of results for any model at post-treatment or follow-up. Thus, body image flexibility was the most consistent predictor of global eating disorder psychopathology across both time points and after adjusting for covariates.

Table 2
Early change models predicting global eating disorder psychopathology at post-treatment and three-month follow up.

Predictor	End of treatment, ITT analyses			3-month follow-up, ITT analyses		
	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable
	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p
Body Image Flexibility	.40 (.16) .013	-.03 (.03) .326	-.05 (.01) < .001	.23 (.16) .154	-.01 (.03) .591	-.04 (.01) .001
Avoidance	.44 (.17) .009	-.01 (.03) .802	-.04 (.02) .009	.27 (.17) .106	.00 (.03) .905	-.04 (.02) .013
Checking	.48 (.16) .002	-.02 (.03) .366	-.02 (.01) .008	.31 (.16) .058	-.01 (.03) .685	-.02 (.01) .057
Compassion	.50 (.16) .002	-.02 (.03) .415	-.06 (.02) .004	.33 (.16) .039	-.01 (.03) .64	-.06 (.02) .007
Fear Expressing Compassion						
Fear Receiving Compassion	.47 (.15) .002	-.01 (.03) .595	-.05 (.02) .009	.30 (.15) .054	-.01 (.03) .899	-.03 (.02) .095
Fear self-Compassion	.47 (.16) .004	-.01 (.03) .680	-.02 (.02) .153	.29 (.16) .068	-.00 (.03) .940	-.01 (.02) .488
Therapeutic Alliance	.45 (.17) .008	-.02 (.03) .565	.20 (.31) .524	.28 (.16) .081	-.01 (.03) .756	.46 (.29) .111
Working alliance						

Note. Significant estimates ($p < .007$) are bolded. p values provided to 3 decimal places due to corrected alpha of .007. SE = Standard Error.

2.3. Clinical impairment

Table 3 presents the estimates and standard errors for early change models predicting clinical impairment at post-treatment and three-month follow-up. At post-treatment, three change variables were significant predictors of clinical impairment: body image flexibility, body image avoidance, and fear of receiving compassion. Behaviour change was not significant in any model nor was working alliance. At three-month follow-up, no change variable was found to be a significant predictor of clinical impairment. When assessing covariates, age and disorder duration were not significant in any model nor did their addition change the pattern of results. Significant estimates were similar in size.

3. Discussion

The aim of this exploratory study was to assess novel early change variables as potential predictors of eating disorder treatment outcomes. Early change in body image flexibility was the most consistent predictor across models, significantly predicting global eating disorder psychopathology at both post-treatment and follow-up and clinical impairment at post-treatment. Early change in the fear of expressing compassion was an additional predictor of post-treatment global eating disorder psychopathology, while early change in body image avoidance and the fear of receiving compassion were additional predictors of post-treatment clinical impairment. No early change variables significantly predicted clinical impairment at follow-up. Covariate analyses demonstrated an identical pattern of results.

Early change in behaviour was included as a covariate to explore novel early change variables after adjusting for its effects. In contrast to previous findings (Linardon et al., 2017; Vall & Wade, 2015), early change in behaviour was not a significant predictor of outcome for the majority of analyses. Two studies that assessed shorter CBT programs (Fischer, Meyer, Dremmel, Schlup, & Munsch, 2014; Masheb & Grilo, 2008) also did not find early change in behaviour to be a significant predictor of outcome. Given a focus of CBT-T is early behaviour change in the first sessions, and this differs from other forms of CBT, this may make early change less predictive as it has become a variable with less variability across the sample. Furthermore, as described in the Method, a collaborative decision to leave treatment occurs at Session 4 if a patient does not demonstrate active engagement in therapy tasks and thus early behavioural change. However, Waller et al. (2018) found early change in global eating disorder psychopathology to predict overall change. Therefore, early change in cognitive symptoms may be a stronger factor than behavioural change in predicting outcome in shorter treatments. Waller et al. (2018) also found early change in

Table 3
Early change models predicting clinical impairment at post-treatment and three-month follow up.

Predictor	End of treatment, ITT analyses			3-month follow-up, ITT analyses		
	Baseline value of outcome	Behaviour change	Early change variable	Baseline value of outcome	Behaviour change	Early change variable
	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p	Estimate (SE) p
Body Image Flexibility	.23 (.12) .063	-.32 (.16) .048	-.40 (.08) < .001	.18 (.18) .315	-.29 (.36) .363	-.31 (.13) .019
Avoidance	.21 (.13) .104	-.15 (.20) .449	-.35 (.10) .001	.17 (.18) .343	-.15 (.34) .647	-.28 (.16) .073
Checking	.24 (.14) .081	-.29 (.19) .128	-.15 (.07) .029	.18 (.19) .335	-.23 (.34) .495	-.05 (.09) .571
Compassion	.20 (.15) .178	-.25 (.19) .188	-.27 (.17) .117	.15 (.18) .390	-.25 (.32) .424	-.38 (.24) .105
Fear Expressing compassion						
Fear Receiving Compassion	.29 (.14) .030	-.24 (.18) .178	-.40 (.13) .003	.23 (.18) .203	-.23 (.32) .477	-.30 (.18) .102
Fear Self-Compassion	.19 (.15) .182	-.19 (.20) .348	-.14 (.13) .258	.17 (.18) .359	-.20 (.34) .543	-.03 (.19) .889
Therapeutic Alliance	.19 (.15) .198	-.23 (.20) .248	2.03 (2.29) .375	.13 (.18) .473	-.23 (.33) .494	4.25 (3.43) .216
Working alliance						

Note.

Significant estimates ($p < .007$) are bolded. p values provided to 3 decimal places due to corrected alpha of .007. SE = Standard Error.

therapeutic alliance to be a significant predictor of outcome whereas the present study did not. However, others also failed to support this finding (Loeb et al., 2005; Raykos et al., 2014; Turner et al., 2015; Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). In the present study, working alliance was high at the first treatment session, possibly limiting the potential for significant improvement in alliance to occur and to affect outcome. Future work should continue to explore whether and under what circumstances early change in behavioural symptoms and therapeutic alliance are significant predictors of outcome.

Body image flexibility was the most consistent change variable to predict global eating disorder psychopathology at both post-treatment and follow-up. Unlike body image avoidance and checking, body image flexibility is not explicitly targeted in standard CBT-ED protocols. Results are consistent with previous residential treatment studies (Bluett et al., 2016; Butryn et al., 2013; Lee et al., 2018), suggesting that CBT can improve body image flexibility. Future work is required to understand the mechanisms through which CBT achieves this. It may be that the use of strategies such as behavioural experiments and mirror exposure create higher-level cognitive shifts (i.e., less worrying about weight/shape, detangling weight/shape from life and future plans). Decreasing disordered eating has a reliable effect on constructs like depression and anxiety without targeting them directly (e.g., Pellizzer, Waller, & Wade, 2018b; Waller et al., 2018), thus a similar process may occur with body image flexibility. Future work might consider evaluating a modified CBT-ED protocol with stronger focus on body image flexibility. Such an approach might consider use of imagery rescripting, which can improve body image flexibility (Pennesi & Wade, 2018). In addition to body image flexibility, early change in body image avoidance was a significant predictor of post-treatment clinical impairment. While not reaching significance, results indicate that early change in body image avoidance and body checking tend to predict improved post-treatment global eating disorder psychopathology. Thus, results from this exploratory research suggest further evaluation of targeting both behaviours in treatment.

To our knowledge, this is the first eating disorder treatment study to explore all three fears of compassion subscales. Unexpectedly, early change in the fear of self-compassion subscale was not a significant predictor of either outcome. Instead, early change in the fear of expressing compassion to others was a significant predictor of post-treatment global eating disorder psychopathology while early change in the fear of receiving compassion from others was a significant predictor of post-treatment clinical impairment. Given that features such as self-criticism and core low self-esteem are maintaining mechanisms of a subgroup of patients with eating disorders (Fairburn, Cooper, & Shafran, 2003), it is not surprising that early change in the fear of expressing and receiving compassion are predictive of improved

outcomes. This is consistent with an initial non-clinical study where the fear of receiving compassion and fear of self-compassion were significantly related to self-coldness, self-criticism, and depression while a fear of expressing compassion towards others was significantly related to insecure attachment styles in addition to self-coldness and inadequacy (Gilbert et al., 2011). However, it is unclear why early change in the fear of self-compassion was not significant, particularly as it was a significant predictor and moderator of outcomes in a prior study (Kelly et al., 2013). Further work is needed to clarify the role of the fears of compassion scales in eating disorder treatment outcomes.

The present study, while exploratory, represents a meaningful addition to the eating disorder treatment literature, particularly in light of the need for more research that examines predictors of outcome (Linardon et al., 2017; Vall & Wade, 2015). Given the exploratory nature of the present study, further research is needed to clarify findings and address limitations. First, these findings are preliminary, and require replication. Further work with longer follow-up is required to explore these outcomes in CBT-T, which has only recently been developed (Waller et al., 2018). Second, while a sample size analysis found the study to be adequately powered, a larger sample might have contributed more robust findings. Finally, given the selection criteria, these findings are not generalizable to those who are underweight and/or not engaged in bingeing or purging.

Exploratory findings from the present study suggest that early change in body image flexibility and the fear of expressing and receiving compassion are predictive of improved outcomes at post-treatment and at three-month follow-up. Model testing in larger samples and with longer follow-up is required to understand the exact mechanisms by which these variables impact on outcomes, and whether there may be potential benefit of modifying existing protocols to incorporate a stronger focus on body image and fear of compassion. Future research of this nature may provide insights into how current treatments can be improved to result in greater rates of remission. Future research might also seek to use novel designs to explore the use of adjunct treatments informed by early change variables. An example might be the design used by Chen et al. (2017), who tested different methods of intensification of therapy when guided self-help CBT was not proving effective at an early stage. Thus, future work on developing CBT-T might adopt similar methodologies to enhance clinical outcomes.

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References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Amin, R., Strauss, C., & Waller, G. (2012). Body-related behaviours and cognitions in the eating disorders. *Behavioural and Cognitive Psychotherapy*, 42, 65–73. <https://doi.org/10.1017/S1352465812000914>.
- Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2012). Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: A systematic review of the literature. *International Journal of Eating Disorders*, 45, 428–438. <https://doi.org/10.1002/eat.20931>.
- Bluett, E. J., Lee, E. B., Simone, M., Lockhart, G., Twohig, M. P., Lensegrav-Benson, T., et al. (2016). The role of body image psychological flexibility on the treatment of eating disorders in a residential facility. *Eating Behaviors*, 23, 150–155. <https://doi.org/10.1016/j.eatbeh.2016.10.002>.
- Bohn, K., Doll, H. A., Cooper, Z., O'Connor, M., Palmer, R. L., & Fairburn, C. G. (2008). The measurement of impairment due to eating disorder pathology. *Behaviour Research and Therapy*, 46, 1105–1110. <https://doi.org/10.1016/j.brat.2008.06.012>.
- Bohn, K., & Fairburn, C. G. (2008). Clinical impairment assessment questionnaire (CIA 3.0). In C. G. Fairburn (Ed.). *Cognitive behavior therapy and eating disorders* (pp. 315–317). New York, NY: Guilford Press.
- Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image*, 17, 117–131. <https://doi.org/10.1016/j.bodyim.2016.03.003>.
- Butryn, M. L., Juarascio, A., Shaw, A., Kerrigan, S. G., Clark, V., O'Plinick, A., et al. (2013). Mindfulness and its relationship with eating disorders symptomatology in women receiving residential treatment. *Eating Behaviors*, 14, 13–16. <https://doi.org/10.1016/j.eatbeh.2012.10.005>.
- Cavallini, A. Q., & Spangler, D. L. (2013). Sudden gains in cognitive-behavioral therapy for eating disorders. *International Journal of Cognitive Therapy*, 6, 292–310. <https://doi.org/10.1521/ijct.2013.6.3.292>.
- Chen, E. Y., Cacioppo, J., Fattich, K., Gallop, R., McCloskey, M. S., Olino, T., et al. (2017). An adaptive randomized trial of dialectical behavior therapy and cognitive behavior therapy for binge-eating. *Psychological Medicine*, 47, 703–717. <https://doi.org/10.1017/S0033291716002543>.
- Danielsen, M., & Rø, Ø. (2012). Changes in body image during inpatient treatment for eating disorders predict outcome. *Eating Disorders*, 20, 261–275. <https://doi.org/10.1080/10640266.2012.689205>.
- Dias, B. S., Ferreira, C., & Trindade, I. A. (2018). *Influence of fears of compassion on body image shame and disordered eating. Eating and weight disorders - studies on Anorexia, bulimia and obesity*. <https://doi.org/10.1007/s40519-018-0523-0> Advance online publication.
- Fairburn, C. G. (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: Guilford Press.
- Fairburn, C. G., & Beglin, S. J. (2008). Eating disorder examination questionnaire (EDE-Q 6.0). In C. G. Fairburn (Ed.). *Cognitive behavior therapy and eating disorders* (pp. 309–314). New York, NY: The Guilford Press.
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy*, 41, 509–528. [https://doi.org/10.1016/S0005-7967\(02\)00088-8](https://doi.org/10.1016/S0005-7967(02)00088-8).
- Ferreira, C., Pinto-Gouveia, J., & Duarte, C. (2011). The validation of the Body Image Acceptance and Action Questionnaire: Exploring the moderator effect of acceptance on disordered eating. *International Journal of Psychology and Psychological Therapy*, 11, 327–345.
- Fischer, S., Meyer, A. H., Dremmel, D., Schlup, B., & Munsch, S. (2014). Short-term cognitive-behavioral therapy for binge eating disorder: Long-term efficacy and predictors of long-term treatment success. *Behaviour Research and Therapy*, 58, 36–42. <https://doi.org/10.1016/j.brat.2014.04.007>.
- Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research and Practice*, 84, 239–255. <https://doi.org/10.1348/147608310X526511>.
- Graves, T. A., Tabri, N., Thompson-Brenner, H., Franko, D. L., Eddy, K. T., Bourin-Bedes, S., ... Thomas, J. J. (2017). A meta-analysis of the relation between therapeutic alliance and treatment outcome in eating disorders. *International Journal of Eating Disorders*, 50, 323–340. <https://doi.org/10.1002/eat.22672>.
- Hatcher, R. L., & Gillaspay, J. A. (2006). Development and validation of a revised short version of the Working Alliance Inventory. *Psychotherapy Research*, 16, 12–25. <https://doi.org/10.1080/10503300500352500>.
- Hill, M. L., Masuda, A., & Lutzman, R. D. (2013). Body image flexibility as a protective factor against disordered eating behavior for women with lower body mass index. *Eating Behaviors*, 14, 336–341. <https://doi.org/10.1016/j.eatbeh.2013.06.003>.
- Horvath, A. O., & Greenberg, L. S. (1989). Development and validation of the working alliance inventory. *Journal of Counseling Psychology*, 36, 223–233.
- IBM Corp. (2013). *IBM SPSS statistics for windows*. Armonk, NY: IBM CorpVersion 22.0.
- Kelly, A. C., Carter, J. C., & Borairi, S. (2014). Are improvements in shame and self-compassion early in eating disorders treatment associated with better patient outcomes? *International Journal of Eating Disorders*, 47, 54–64. <https://doi.org/10.1002/eat.22196>.
- Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of self-compassion interact to predict response to eating disorders treatment: A preliminary investigation. *Psychotherapy Research*, 23, 252–264. <https://doi.org/10.1080/10503307.2012.717310>.
- Kelly, A. C., Wisniewski, L., Martin-Wager, C., & Hoffman, E. (2017). Group-based compassion-focused therapy as an adjunct to outpatient treatment for eating disorders: A pilot randomized controlled trial. *Clinical Psychology & Psychotherapy*, 24, 475–487. <https://doi.org/10.1002/cpp.2018>.
- Lee, E. B., Ong, C. E., Twohig, M. P., Lensegrav-Benson, T., & Quakenbush-Roberts, B. (2018). Increasing body image flexibility in a residential eating disorder facility: Correlates with symptom improvement. *Eating Disorders*, 26, 185–199. <https://doi.org/10.1080/10640266.2017.1366229>.
- Linardon, J., Brennan, L., & de la Piedad Garcia, X. (2016). Rapid response to eating disorder treatment: A systematic review and meta-analysis. *International Journal of Behavioral Medicine*, 49, 905–919. <https://doi.org/10.1002/eat.22595>.
- Linardon, J., de la Piedad Garcia, X., & Brennan, L. (2017). Predictors, moderators, and mediators of treatment outcome following manualised cognitive-behavioural therapy for eating disorders: A systematic review. *European Eating Disorders Review*, 25, 3–12. <https://doi.org/10.1002/erv.2492>.
- Loeb, K. L., Wilson, G. T., Labouvie, E., Pratt, E. M., Hayaki, J., Walsh, B. T., et al. (2005). Therapeutic alliance and treatment adherence in two interventions for bulimia nervosa: A study of process and outcome. *Journal of Consulting and Clinical Psychology*, 73, 1097–1107. <https://doi.org/10.1037/0022-006X.73.6.1097>.
- Lydecker, J. A., Cotter, E. W., & Mazzeo, S. E. (2014). Body checking and body image avoidance: Construct validity and norms for college women. *Eating Behaviors*, 15, 13–16. <https://doi.org/10.1016/j.eatbeh.2013.10.009>.
- MacDonald, D. E., Trottier, K., & Olmsted, M. P. (2017). Rapid improvements in emotion regulation predict intensive treatment outcome for patients with bulimia nervosa and purging disorder. *International Journal of Eating Disorders*, 50, 1152–1161. <https://doi.org/10.1002/eat.22766>.
- Maïano, C., Morin, A. J. S., Monthuy-Blanc, J., & Garbarino, J. (2009). The Body Image Avoidance Questionnaire: Assessment of its construct validity in a community sample of French adolescents. *International Journal of Behavioral Medicine*, 16, 125–135. <https://doi.org/10.1007/s12529-009-9035-7>.
- Masheb, R. M., & Grilo, C. M. (2008). Examination of predictors and moderators for self-help treatments of binge-eating disorder. *Journal of Consulting and Clinical Psychology*, 76, 900–904. <https://doi.org/10.1037/a0012917>.
- Mond, J. M., Hay, P. J., Rodgers, B., & Owen, C. (2006). Eating disorder examination questionnaire (EDE-Q): Norms for young adult women. *Behaviour Research and Therapy*, 44, 53–62. <https://doi.org/10.1016/j.brat.2004.12.003>.
- Moore, M., Masuda, A., Hill, M. L., & Goodnight, B. L. (2014). Body image flexibility moderates the association between disordered eating cognition and disordered eating behavior in a non-clinical sample of women: A cross-sectional investigation. *Eating Behaviors*, 15, 664–669. <https://doi.org/10.1016/j.eatbeh.2014.08.021>.
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Pellizzer, M. L., Tiggemann, M., Waller, G., & Wade, T. D. (2018). Measures of body image: Confirmatory factor analysis and association with disordered eating. *Psychological Assessment*, 30, 143–153. <https://doi.org/10.1037/pas0000461>.
- Pellizzer, M. L., Waller, G., & Wade, T. D. (2018a). Body image flexibility: A predictor and moderator of outcome in transdiagnostic outpatient eating disorder treatment. *International Journal of Eating Disorders*, 51, 368–372. <https://doi.org/10.1002/eat.22842>.
- Pellizzer, M. L., Waller, G., & Wade, T. D. (2018b). Ten-session cognitive behaviour therapy for eating disorders: Outcomes from a pragmatic pilot study of Australian non-underweight clients. *Clinical Psychologist*. <https://doi.org/10.1111/cp.12170> Advance online publication.
- Pennesi, J.-L. P., & Wade, T. D. (2018). Imagery rescripting and cognitive dissonance: A randomized controlled trial of two brief online interventions for women at risk of developing an eating disorder. *International Journal of Eating Disorders*, 1–10. <https://doi.org/10.1002/eat.22849> Advance online publication.
- Peterson, C. B., Berg, K. C., Crosby, R. D., Lavender, J. M., Accurso, E. C., Ciao, A. C., ... Wonderlich, S. A. (2017). The effects of psychotherapy treatment on outcome in bulimia nervosa: Examining indirect effects through emotion regulation, self-directed behavior, and self-discrepancy within the mediation model. *International Journal of Eating Disorders*, 50, 636–647. <https://doi.org/10.1002/eat.22669>.
- Raykos, B. C., McEvoy, P. M., Erceg-Hurn, D., Byrne, S. M., Fursland, A., & Nathan, P. (2014). Therapeutic alliance in enhanced cognitive behavioural therapy for bulimia nervosa: Probably necessary but definitely insufficient. *Behaviour Research and Therapy*, 57, 65–71. <https://doi.org/10.1016/j.brat.2014.04.004>.
- Reas, D. L., Whisenhunt, B. L., Netemeyer, R., & Williamson, D. A. (2002). Development of the body checking questionnaire: A self-report measure of body checking behaviors. *International Journal of Eating Disorders*, 31, 324–333. <https://doi.org/10.1002/eat.10012>.
- Rosen, J. C., Srebnik, D., Saltzberg, E., & Wendt, S. (1991). Development of a body image avoidance questionnaire. *Psychological Assessment: Journal of Consulting and Clinical Psychology*, 3, 32–37. <https://doi.org/10.1037/1040-3590.3.1.32>.
- Sandoz, E. K., Wilson, K. G., Merwin, R. M., & Kellum, K. K. (2013). Assessment of body image flexibility: The body image-acceptance and action questionnaire. *Journal of Contextual Behavioral Science*, 2, 39–48. <https://doi.org/10.1016/j.jcbs.2013.03.002>.
- Spangler, D. L., Baldwin, S. A., & Agras, W. S. (2004). An examination of the mechanisms of action in cognitive behavioral therapy for bulimia nervosa. *Behavior Therapy*, 35, 537–560. [https://doi.org/10.1016/S0005-7894\(04\)80031-5](https://doi.org/10.1016/S0005-7894(04)80031-5).
- Tabachnick, B. G., & Fidell, L. S. (2012). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.
- Turner, H., Bryant-Waugh, R., & Marshall, E. (2015). The impact of early symptom change and therapeutic alliance on treatment outcome in cognitive-behavioural therapy for eating disorders. *Behaviour Research and Therapy*, 73, 165–169. <https://doi.org/10.1016/j.brat.2015.08.006>.
- Tylka, T. L., & Wood-Barcalow, N. L. (2015). What is and what is not positive body image? Conceptual foundations and construct definition. *Body Image*, 14, 118–129. <https://doi.org/10.1016/j.bodyim.2015.04.001>.
- Vall, E., & Wade, T. D. (2015). Predictors of treatment outcome in individuals with eating

- disorders: A systematic review and meta-analysis. *International Journal of Eating Disorders*, 48, 946–971. <https://doi.org/10.1002/eat.22411>.
- Wade, T. D., & Pellizzer, M. L. (2018). Assessment of eating disorders. In M. Selbom, & J. Suhr (Eds.). *Cambridge handbook of clinical assessment and diagnosis*. Cambridge: Cambridge University Press.
- Waller, G., Cordery, H., Corstorphine, E., Hinrichsen, H., Lawson, R., Mountford, V., et al. (2007). *Cognitive behavioral therapy for eating disorders: A comprehensive treatment guide*. Cambridge, UK: Cambridge University Press.
- Waller, G., Tatham, M., Turner, H., Mountford, V. A., Bennetts, A., Bramwell, K., ... Ingram, L. (2018). A 10-session cognitive behavioral therapy (CBT-T) for eating disorders: Outcomes from a case series of nonunderweight adult patients. *International Journal of Eating Disorders*, 51, 262–269. <https://doi.org/10.1002/eat.22837>.
- Webb, J. B., Wood-Barcalow, N. L., & Tylka, T. L. (2015). Assessing positive body image: Contemporary approaches and future directions. *Body Image*, 14, 130–145. <https://doi.org/10.1016/j.bodyim.2015.03.010>.
- Wilson, D. B. (2018). Practical meta-analysis effect size calculator: Correlation and sample size. Retrieved from <https://campbellcollaboration.org/escalc/html/EffectSizeCalculator-R2.php>.
- Wilson, G. T., Fairburn, C. G., Agras, W. S., Walsh, B. T., & Kraemer, H. (2002). Cognitive-behavioral therapy for bulimia nervosa: Time course and mechanisms of change. *Journal of Consulting and Clinical Psychology*, 70, 267–274. <https://doi.org/10.1037//0022-006X.70.2.267>.