Published in final edited form as:

Cognit Ther Res. 2020 February ; 44(1): 208–215. doi:10.1007/s10608-019-10035-w.

Cognitive Behavioral Therapy for Body Image and Self-Care (CBT-BISC) among Sexual Minority Men Living with HIV: Skills-Based Treatment Mediators

Patrycja Klimek^a, Sabine Wilhelm^b, Steven A. Safren^c, Aaron J. Blashill^{a,d}

^aSan Diego State University/University of California, San Diego Joint Doctoral Program in Clinical Psychology, 6363 Alvarado Court, Suite 101, San Diego, CA 92120

^bDepartment of Psychiatry, Massachusetts General Hospital and Harvard Medical School, 85 Simches Research Bldg., Floor 2, Boston, MA 02114

^cDepartment of Psychology, University of Miami, Coral Gables, FL 33124

^dSan Diego State University, 6363 Alvarado Court, Suite 101, San Diego, CA 92120

Abstract

Individuals develop coping skills in response to body image distress; however, the degree to which body image improvements are mediated by skill acquisition is unknown. The current study assessed skills-based mediators of CBT-BISC ($n = 22$) versus enhanced treatment-as-usual ($n = 22$) for sexual minority men with HIV and body image disturbance. Skills-based mediators included avoidance, appearance fixing, and acceptance and cognitive reappraisal. Results revealed that CBT-BISC significantly reduced body image disturbance and improved coping skills. Latent difference score mediation indicated that changes in acceptance and cognitive reappraisal significantly predicted body image disturbance changes ($b = -.96, p = .001$). These strategies may, therefore, have a unique role in reducing body image disturbance in sexual minority men with HIV. Clinicians may wish to prioritize these strategies in CBT-BISC. Future treatment research, with methodologically rigorous mediation designs, is needed to assess mechanisms of change and consequently improve efficacy.

Terms of use and reuse: academic research for non-commercial purposes, see here for full terms. <https://www.springer.com/aam-terms-v1>

Correspondence concerning this article should be addressed to Aaron J. Blashill, Department of Psychology, SDSU/UC San Diego Joint Doctoral Program in Clinical Psychology, 6363 Alvarado Court, Suite 101, San Diego, CA 92120., ajblashill@sdsu.edu, Telephone: 619-594-2245.

Conflict of Interest: All authors declare that they have no conflicts of interest.

Declarations of interest: none

Compliance with Ethical Standards

Research Involving Human Participants: The current study involved secondary data analysis from a randomized controlled trial approved by the Institutional Review Boards of Fenway Health and San Diego State University. All procedures of the randomized controlled trial involving human participants were in accordance with ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: The following study involved a secondary data analysis and was IRB exempt from requiring informed consent, as no identifying information was available for secondary data analysis. However, informed consent was obtained from all individual participants at the time of original data collection.

Publisher's Disclaimer: This Author Accepted Manuscript is a PDF file of an unedited peer-reviewed manuscript that has been accepted for publication but has not been copyedited or corrected. The official version of record that is published in the journal is kept up to date and so may therefore differ from this version.

Keywords

body image; coping; sexual minority; HIV; cognitive behavioral therapy

Identification and investigation of factors that may or may not contribute to therapeutic change, such as therapeutic alliance (Klein et al., 2013) or specific skills/techniques embedded within evidence-based treatments (e.g., cognitive behavioral therapy; CBT; Whisman, 1993), is an important step to understanding how and why psychological treatments work. Enhanced understanding of what leads to change in symptoms may aid therapists to identify strategies that optimize treatment, increasing efficiency and effectiveness of clinical work (Kraemer, Wilson, Fairburn, & Agras, 2002). One method that contributes to understanding mechanisms of treatment change is mediator analysis (Kazdin, 2007). In the therapeutic context, skills-based mediators of treatment outcome may inform whether change in specific skills, that are targeted in a treatment protocol, accounts for the positive effects of the treatment on symptoms. Anxiety disorder research has demonstrated increased attention on exploring mediators of treatment outcome in CBT (Smits, Julian, Rosenfield, & Powers, 2012); for example, changes in cognitive appraisal significantly mediated the effect of CBT on social anxiety symptoms (Goldin et al., 2012). Identifying these mediators may encourage therapists to focus on enhancing strategies to teach those particularly significant skills (Smits et al., 2012).

There is, however, a paucity of literature examining skills-based mediators of treatment outcome in disorders involving body image disturbance (e.g., eating disorders, body dysmorphic disorder). Eating disorders (EDs) and body dysmorphic disorder (BDD) are associated with high rates of substance abuse, gastrointestinal complications, obesity, suicidality, and premature mortality, with approximate lifetime prevalence rates of 0.6% to 4.5% for EDs (Hudson, Hiripi, Pope, & Kessler, 2007) and point prevalence of 2.4% for BDD (Veale, Gledhill, Christodoulou, & Hodson, 2016) in the general U.S. population. CBT is an efficacious treatment for body image disorders (Fairburn, 2008; Harrison, de la Cruz, Enander, Radua, & Mataix-Cols, 2016), associated with improvements in cognitive (e.g., appearance investment), affective (e.g., dissatisfaction), and behavioral (e.g., avoidance) body image symptoms in both clinical and nonclinical samples (Jarry & Ip, 2005). However, little is known about the skills-based mediators in this gold standard body image treatment.

Body image disorder researchers have examined symptom mediators, such as reduction in dietary restraint or attitudes about weight and shape, in explaining CBT effects on binge eating and purging behaviors (Wilson, Fairburn, Agras, Walsh, & Kraemer, 2002). Further, few studies have investigated therapy-related mediators of the effect of evidence-based interventions on ED symptoms, with mixed findings. For example, an investigation of mediators of acceptance and commitment therapy compared with treatment-as-usual yielded that therapy-related variables such as acceptance, mindfulness, and cognitive defusion did not significantly mediate symptom improvements (Juarascio et al., 2013). However, a study of mediators of the effect of a novel binge eating group intervention (BEfree) indicated that, for example, mindfulness mediated the effect of BEfree on overall eating psychopathology and cognitive defusion had a significant mediating effect on binge eating (Pinto-Gouveia et

al., 2016). Although researchers are beginning to investigate therapeutic skills-based mediators of ED treatment outcome, little is known about skills-based mediators of treatment for body image disturbance, including body dysmorphia. Therefore, more research is needed to explore mediators of CBT in body image disorders.

Acquisition and application of adaptive coping skills may be a potential mediator of CBT in body image disorders. The cognitive-behavioral model of body image disturbance indicates that individuals develop cognitive and behavioral coping strategies in response to body image-related distress (Cash, 2002). For example, men and women using maladaptive coping strategies, such as avoidance (e.g., of mirrors) and appearance fixing (i.e., preoccupation with correcting perceived defects), exhibited high levels of body dissatisfaction and eating disorder symptoms (Cash, Santos, & Williams, 2005). Cash and colleagues (2005) identified avoidance, appearance fixing, and acceptance and cognitive reappraisal as common strategies that people may use to cope with body image stressors. CBT for body image disorders attempts to reduce experiential and behavioral avoidance through exposures and aims to reduce rituals (e.g., appearance fixing, checking) through ritual prevention strategies (Butters & Cash, 1987). CBT also changes the content of maladaptive thoughts via cognitive restructuring and the functional relationship with thoughts via acceptance, which can also subsequently impact maladaptive behaviors (e.g., avoidance, rituals). Consistent with these theorized treatment mechanisms, CBT demonstrates successful reductions in avoidance and rituals, such as appearance fixing, as well as improvements in cognitive coping (Butters & Cash, 1987; Rosen & Reiter, 1996). Although CBT addresses coping skills such as avoidance, appearance fixing, acceptance, and cognitive coping, little is known if body image improvements are mediated by the acquisition of adaptive and reduction of maladaptive coping skills during the course treatment.

Sexual minority (e.g., gay and bisexual) men living with HIV are at particular risk for elevated body image disturbance (e.g., Kelly, Langdon, & Serpell, 2009). Lipodystrophy is an HIV-related symptom that is characterized by body changes such as fat loss as well as fat redistribution in localized areas of the body (Stears & Hames, 2014) and is associated with elevated body image disturbance (Blashill, Goshe, Robbins, Mayer, & Safren, 2014). In addition to self-reported lipodystrophy, sexual minority men experience social pressures, either from society or the sexual minority community, to conform to a muscular and lean body ideal, which also negatively impacts body image (Tylka & Andorka, 2012). Sexual minority men experience body image disturbance at higher levels than heterosexual men, with prevalence rates of 29% to 32% among sexual minority men compared with 21% among heterosexual men (Frederick & Essayli, 2016; Peplau et al., 2009). To address mental health needs of sexual minority men living with HIV, cognitive behavioral therapy for body image and self-care (CBT-BISC) was developed, and preliminary efficacy, compared with enhanced treatment-as-usual, was demonstrated in reducing body image disturbance, in this vulnerable population (Blashill et al., 2017). A better understanding of skills-based treatment mediators of CBT-BISC outcomes in this population may provide a framework for testing potential mechanisms of change in CBT for body image disorders in the general population.

The proposed study aimed to analyze data from a randomized controlled trial to assess skills-based mediators of treatment outcome in a body image treatment (CBT-BISC) for sexual minority men living with HIV and body image disturbance. The study hypotheses included the following: (a) increased cognitive reappraisal and acceptance will mediate the effect of CBT-BISC on body image disturbance; (b) decreased body image avoidance will mediate the effect of CBT-BISC on body image disturbance; and (c) decreased ritualistic coping—specifically, appearance fixing—will mediate the effect of CBT-BISC on body image disturbance. An additional exploratory research question was determining which of these skills accounted for the most variance in the association between treatment assignment and body image disturbance.

Method

Participants

Secondary data analysis was conducted from a two-arm randomized controlled trial, for which the primary outcomes have previously been published (Blashill et al., 2017). Participants were 44 sexual minority men living with HIV who (a) reported significant levels of body image disturbance, as indicated by a cut-off score of 16 or higher on the clinician-administered Yale-Brown Obsessive-Compulsive Scale, Modified for Body Dysmorphic Disorder (BDD-YBOCS; Phillips et al., 1997); (b) were HIV-infected; (c) reported oral or anal sex (with or without condoms) with men in the past 12 months; (d) self-identified as male; (e) were 18 to 65 years of age; and (f) used antiretroviral therapy (ART) for the past 2 months or longer.

Procedures

After informed consent, all participants completed a baseline assessment to determine eligibility, during which they completed BDD-YBOCS, which is a broad measure of body image disturbance (used to determine clinically significant levels of body image disturbance) and self-report measures. Upon eligibility, participants were randomized to receive CBT-BISC ($n = 22$) or an enhanced treatment-as-usual condition (E-TAU; $n = 22$). Participants were scheduled for Session 1 approximately 2 weeks after the baseline visit. All participants, regardless of randomization, received the same Session 1 protocol, which focused on psychoeducation and behavioral skills for ART adherence. After the session, all participants were informed of their randomization.

Participants were randomly assigned in blocks of four and stratified by body image disturbance score (i.e., 36 or higher on BDD-YBOCS denoting severe body image disturbance), in order to ensure equal distribution of severe body image disturbance across treatment conditions. Clinicians were blinded to random assignment until the end of Session 1.

After Session 1, participants in the E-TAU condition attended sessions over 3 months, every two weeks, targeting antiretroviral therapy adherence with a program coordinator. The program coordinator also provided referrals for mental health treatment. Each session was approximately 15 minutes. In contrast, participants in the CBT-BISC condition met with a

clinician on a weekly basis. Participants in this condition completed 12, 50-minute sessions in total, which entailed agenda setting, adherence review, homework, and introduction of new material. CBT-BISC is a manualized treatment including seven modules on body image improvement and CBT strategies (Blashill et al., 2017). Module 1 is an orientation to CBT, Module 2 involved acquisition of mindfulness and acceptance-based skills, Module 3 is perceptual retraining, Module 4 involved cognitive restructuring skills, and Module 5 incorporated exposure-based techniques targeting situations that participants avoid due to body image disturbance. Finally, Modules 6 and 7 involved response and relapse prevention. Participants in both conditions completed an assessment after the last treatment session (i.e., 3 months from baseline) and a follow-up assessment, 6 months from baseline. Please see Blashill et al. (2017) for more procedural details.

Measures

Body image disturbance—Body image disturbance was measured using the Body Image Disturbance Questionnaire (BIDQ; Cash, Phillips, Santos, & Hrabosky, 2004). The BIDQ is a 7-item self-report measure of body image disturbance on a scale from 1 (*least severe*) to 5 (*most severe*). Body image disturbance in the current study was represented by an average score, such that higher scores represent greater body image disturbance. The BIDQ demonstrates acceptable internal consistency, test-retest reliability, and good concurrent, discriminant, and construct validity (Cash & Grasso, 2005; Cash et al., 2004). Internal consistency in the current study ranged from $\alpha = .88$, at baseline, to $\alpha = .96$ at follow-up.

Body image coping skills—The Body Image Coping Strategies Inventory (BICSI; Cash et al., 2005) was used to assess coping skills. The BICSI is a 29-item measure in which individuals are asked to respond, on a scale from 0 (*definitely not like me*) to 3 (*definitely like me*), how they cope to a variety of situations that may threaten their body image. Subscales denote different coping strategies: (1) Positive Rational Acceptance, (2) Appearance Fixing, and (3) Avoidance. Items from the Positive Rational Acceptance subscale include both mindful acceptance (“I react by being especially patient with myself”) and cognitive reappraisal strategies (e.g., “I try to figure out why I am challenged or threatened by the situation”). Therefore, this subscale will be referred to as “acceptance and cognitive reappraisal strategies.” An example item from the Appearance Fixing subscale is “I spend extra time trying to fix what I don’t like about my looks,” and the Avoidance subscale includes items such as “I try to ignore the situation and my feelings.” The mean scores were calculated for each subscale, per guidelines from Cash’s (2005) manual. The BICSI demonstrates good test-retest reliability, internal consistency, and structural validity in both male and female samples (Cash & Grasso, 2005; Cash et al., 2005). Internal consistency in the current study was calculated for each subscale: (a) Appearance Fixing at baseline ($\alpha = .77$) and posttreatment ($\alpha = .88$); (b) Avoidance at baseline ($\alpha = .73$) and posttreatment ($\alpha = .72$); and (c) Acceptance and cognitive reappraisal at baseline ($\alpha = .86$) and posttreatment ($\alpha = .83$).

Data Analysis

Latent difference score mediation (Selig & Preacher, 2009) was conducted using Mplus software (version 7.4). In the proposed model (see Figure 1), body image disturbance, as measured by the BIDQ, was the outcome variable, treatment condition (CBT-BISC vs. enhanced treatment-as-usual) was the independent variable, and the mediator variables were subscales of the BICSI: (a) avoidance, (b) appearance-fixing, and (c) acceptance and cognitive reappraisal. Latent variables were created with latent difference scores from baseline to posttreatment for mediators and baseline to follow-up for the outcome variable. All three proposed mediators were entered into the model simultaneously, allowing a test of which mediator(s) accounts for the most variance in the association between treatment assignment and body image disturbance. Standardized regression coefficients were reported as well as 95% confidence intervals. Overall model fit was assessed by examining the chi-square statistical test of fit, as well as commonly used descriptive fit indices: root-mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker-Lewis index (Hu & Bentler, 1999). Hu and Bentler (1999) indicated a cut-off of .90 for CFI and TLI and .05 for RMSEA. Additionally, an effect size index (ES; Hansen & McNeal, 1996) was calculated to compare the magnitude of effects between the three moderators whilst removing the influence of sample size. This effect size measure has been recommended by Preacher and Kelley (2011) for models with a dichotomous independent variable.

Results

Participants

The participants included sexual minority men who identified as either gay ($n = 43$) or bisexual ($n = 1$). The mean age of participants was 46 years ($SD = 11$). Participants were allowed to self-report more than one race and identified as primarily White (63.6%; $n = 28$), 34.1% Black ($n = 15$), 4.5% Native American, and 4.5% identifying with an “Other” race. Majority of the sample also met criteria for BDD (68.2%; $n = 30$), 18.2% of the sample met criteria for an ED ($n = 8$), and 95.5% ($n = 42$) of participants met criteria for at least one psychiatric diagnosis, determined using the Structured Clinical Interview for the DSM-IV-TR for ED and BDD (First, Spitzer, Gibbon, & Williams, 2002) and the Mini International Neuropsychiatric Interview for other psychiatric diagnoses (Sheehan et al., 1997). Correlations between the outcome variable (BIDQ) and mediator variables (BICSI subscales) at all timepoints did not indicate large shared variance (see Table 1), despite sharing aspects of the same construct—behavioral or cognitive body image disturbance.

Mediation Analysis

The latent difference score model fit the data well, ($\chi^2 [14] = 15.02$, $p = .38$, RMSEA = 0.04, CFI = 0.99, TLI = 0.98). Main effects indicated that treatment condition predicted changes in body image disturbance, such that participants in the CBT-BISC condition demonstrated greater reductions in body image disturbance than participants in the E-TAU condition, from baseline to follow-up ($\beta = -0.24$ [95% CI: $-0.46, -0.02$], $SE = 0.11$, $t = -2.09$, $p = .036$). Moreover, participants in the CBT-BISC condition demonstrated greater reductions in avoidance ($\beta = -0.34$ [95% CI: $-0.58, -0.10$], $SE = 0.12$, $t = -2.82$, $p = .005$)

and appearance fixing ($\beta = -0.24$ [95% CI: $-0.48, -0.01$], $SE = 0.12$, $t = -1.97$, $p = .049$) coping strategies and greater improvements in acceptance and cognitive reappraisal ($\beta = 0.32$ [95% CI: $0.07, 0.56$], $SE = 0.12$, $t = 2.56$, $p = .01$), than participants in the E-TAU condition, from baseline to posttreatment. However, only change in acceptance and cognitive reappraisal predicted improvements in body image disturbance across both conditions ($\beta = -0.47$ [95% CI: $-0.74, -0.20$], $SE = 0.14$, $t = -3.40$, $p = .001$).

The sum of indirect effects of coping strategies between the effect of treatment on body image disturbance was statistically significant ($\beta = -0.28$ [95% CI: $-0.44, -0.12$], $SE = 0.08$, $t = -3.35$, $p = .001$). Of the three coping strategies, changes in acceptance and cognitive reappraisal significantly mediated the effect of treatment on changes in body image disturbance ($\beta = -0.15$ [95% CI: $-0.28, -0.02$], $SE = 0.07$, $t = -2.19$, $p = .03$). However, changes in appearance fixing ($\beta = -0.06$ [95% CI: $-0.14, 0.03$], $SE = 0.04$, $t = -1.26$, $p = .21$) and avoidance ($\beta = -0.08$ [95% CI: $-0.19, 0.04$], $SE = 0.06$, $t = -1.34$, $p = .18$) did not significantly mediate the effect of treatment condition on changes in body image disturbance. The effect size for the indirect effect of acceptance and cognitive reappraisal coping ($ES = -0.607$) was 1.6 times larger than the effect size for the indirect effect of appearance fixing ($ES = -0.369$) and 1.5 times larger than the effect size for the indirect effect of avoidance ($ES = -0.395$).

Discussion

To our knowledge, the current study is one of the first to assess skills-based treatment mediators in a body image treatment. Findings indicate that increased acquisition of mindful acceptance and cognitive reappraisal strategies mediated improvements in body image disturbance for sexual minority men who received CBT-BISC. These findings demonstrate that acquisition of skills that involve directly changing thought processes (via cognitive reappraisal) or how one relates to their thought processes (via acceptance) predict better body image outcomes than acquisition of behavioral skills (i.e., reductions in avoidance or appearance fixing). Theoretical models of body image disorders (van den Berg, Thompson, Obrowski-Brandon, & Covert, 2002; Veale, 2004) indicate that factors such as negative appraisal and internalization of societal body ideals may lead to avoidance and appearance fixing behaviors, thus maintaining body image disturbance. When considering possible mechanisms of the CBT-BISC effect, acceptance and cognitive reappraisal rather than behavioral mechanisms (e.g., avoidance or appearance fixing) uniquely accounted for significant variance in improvement of body image disturbance. Therefore, altering maladaptive thinking patterns or using acceptance to change the way one relates to thought processes may play a large role in CBT success for individuals with body image disorders.

Acquisition of both cognitive and behavioral CBT skills have been implicated as potential mediators of CBT for anxiety disorders (Powers, de Kleine, & Smits, 2017). Changes in cognitive appraisal, for example, have consistently mediated the effect of CBT on social anxiety symptoms (e.g., Goldin et al., 2012), depression (e.g., Kaufman, Rohde, Seeley, Clarke, & Stice, 2005), and PTSD (e.g., McLean, Yeh, Rosenfield, & Foa, 2015). Moreover, changes in cognitions rather than behavioral activation uniquely accounted for significant variance in depressive symptom improvements among adolescents receiving CBT (Kaufman

et al., 2005). The current study corroborates the role of cognitive aspects of CBT, as a potential mechanism of change across multiple pathologies. However, prior evidence for cognitive coping mediation in CBT is mixed; for example, reductions in obsessive beliefs did not mediate the effect of CBT on OCD symptom reductions (Su, Carpenter, Zandberg, Simpson, & Foa, 2016). Therefore, future empirical exploration is needed to better understand the mediating role of cognitive and behavioral skills in the effect of CBT on psychiatric symptoms.

Kazdin (2007) identified research designs that evaluate potential mediators or mechanisms of treatment change to varying degrees. An ideal design, according to Kazdin, would include assessments of both the mediators and outcomes at all or most sessions, including pre- and posttreatment. The current study's design included assessments of both mediators and outcomes pre- and posttreatment, as well as assessment of the outcome at a follow-up timepoint. Although the posttreatment timepoint falls between pre-treatment and follow-up, this assessment was technically not during treatment, the ideal feature of mediation. Therefore, a current study limitation is that the timing of measurements was partially sequential, such that the mediator and dependent variable shared the baseline timepoint. It is, therefore, possible that body image disturbance improvements may have preceded changes in coping skills. Nevertheless, the current study's design allows for evaluation of time sequence, an improvement upon mediation studies that only assess mediators and outcomes at two concurrent timepoints.

The current study has additional limitations to consider. The BICSI has conflated acceptance and cognitive reappraisal coping skill items into one subscale; therefore, future research is needed to better understand if acceptance or cognitive reappraisal play a greater role in mediating the CBT effect on body image disturbance. Additionally, the sample sizes for each condition were small ($n = 22$); Simone (2018) indicated that a sample size estimate of 40 is needed to detect a large effect with latent difference score mediation analysis. Therefore, future research with larger sample sizes is needed to provide strong support for the current study's findings. Additionally, the comparison control condition was not a time and intention control; therefore, future research is needed to replicate mediated pathways purported in the current study, with a more active control condition (e.g., supportive psychotherapy).

The current study indicates that a potential mediator in the effect of CBT-BISC on body image disturbance is the acquisition of acceptance and cognitive reappraisal coping strategies. Clinicians may, therefore, prioritize teaching these skills earlier in treatment, when administering CBT-BISC. However, caution must be taken in interpreting acceptance and cognitive appraisal strategies as mechanisms of change because of the study's methodological limitations (i.e., timing of assessments for mediators and outcome). The results, nevertheless, establish a model for future mediation analysis in body image disorder treatment research and alert the need for methodologically rigorous mediation designs. Despite limitations, the present study demonstrates the need for future research to design randomized controlled trials, a priori, with multiple assessment timepoints for potential mediators (Kazdin, 2007). Identifying treatment-related coping skills as key constructs in treatment outcome will be a vital step towards testing mechanisms of change (Kazdin,

2007), which may ultimately lead to informed modifications of existing evidence-based treatments to improve efficacy.

Acknowledgments

This research was supported by K23MH096647, awarded to Dr. Aaron J. Blashill. Author time for Dr. Steven A. Safren was supported by K24DA040489. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

- Blashill AJ, Goshe BM, Robbins GK, Mayer KH, & Safren SA (2014). Body image disturbance and health behaviors among sexual minority men living with HIV. *Health Psychology, 33*, 677–680. 10.1037/hea0000081 [PubMed: 24977311]
- Blashill AJ, Safren SA, Wilhelm S, Jampel J, Taylor SW, O’Cleirigh C, & Mayer KH (2017). Cognitive behavioral therapy for body image and self-care (CBT-BISC) in sexual minority men living with HIV: A randomized controlled trial. *Health Psychology, 36*, 937–946. 10.1037/hea0000505 [PubMed: 28541068]
- Butters JW, & Cash TF (1987). Cognitive-behavioral treatment of women’s body-image dissatisfaction. *Journal of Consulting and Clinical Psychology, 55*, 889–897. 10.1037/0022-006X.55.6.889 [PubMed: 2891736]
- Cash TF (2002). Cognitive-behavioral perspectives on body image In Cash TF & Pruzinsky T (Eds.), *Body image: A handbook of theory, research, and clinical practice* (pp. 38–46). New York, NY: Guilford Press
- Cash TF, & Grasso K (2005). The norms and stability of new measures of the multidimensional body image construct. *Body Image, 2*, 199–203. 10.1016/j.bodyim.2005.03.007 [PubMed: 18089188]
- Cash TF, Phillips KA, Santos MT, & Hrabosky JI (2004). Measuring “negative body image”: Validation of the Body Image Disturbance Questionnaire in a nonclinical population. *Body Image, 1*, 363–372. 10.1016/j.bodyim.2004.10.001
- Cash TF, Santos MT, & Williams EF (2005). Coping with body-image threats and challenges: Validation of the Body Image Coping Strategies Inventory. *Journal of Psychosomatic Research, 58*, 190–199. 10.1016/j.jpsychores.2004.07.008 [PubMed: 15820848]
- Fairburn CG (2008). *Cognitive behavior therapy and eating disorders*. New York, NY: Guilford Press.
- First MB, Spitzer RL, Gibbon M, & Williams JB (2002). *Structured clinical interview for DSM-IV-TR axis I disorders, research version, patient edition (SCID-I/P)*. New York, NY: New York State Psychiatric Institute Biometrics Research.
- Frederick DA, & Essayli JH (2016). Male body image: The roles of sexual orientation and body mass index across five national US Studies. *Psychology of Men & Masculinity, 17*, 336–351. 10.1037/men0000031
- Goldin PR, Ziv M, Jazaieri H, Werner K, Kraemer H, Heimberg RG, & Gross JJ (2012). Cognitive reappraisal self-efficacy mediates the effects of individual cognitive-behavioral therapy for social anxiety disorder. *Journal of Consulting and Clinical Psychology, 80*, 1034–1040. 10.1037/a0028555 [PubMed: 22582765]
- Harrison A, de la Cruz LF, Enander J, Radua J, & Mataix-Cols D (2016). Cognitive-behavioral therapy for body dysmorphic disorder: A systematic review and meta-analysis of randomized controlled trials. *Clinical Psychology Review, 48*, 43–51. 10.1016/j.cpr.2016.05.007 [PubMed: 27393916]
- Hu L, & Bentler PM (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1–55. 10.1080/10705519909540118
- Hudson JI, Hiripi E, Pope HG, & Kessler RC (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 61*, 348–358. 10.1016/j.biopsych.2006.03.040 [PubMed: 16815322]

- Jarry JL, & Ip K (2005). The effectiveness of stand-alone cognitive-behavioural therapy for body image: A meta-analysis. *Body Image*, 2, 317–331. 10.1016/j.bodyim.2005.10.001 [PubMed: 18089198]
- Juarascio A, Shaw J, Forman E, Timko CA, Herbert J, Butryn M, ... Lowe M (2013). Acceptance and commitment therapy as a novel treatment for eating disorders: An initial test of efficacy and mediation. *Behavior Modification*, 37, 459–489. 10.1177/0145445513478633 [PubMed: 23475153]
- Kaufman NK, Rohde P, Seeley JR, Clarke GN, & Stice E (2005). Potential mediators of cognitive-behavioral therapy for adolescents with comorbid major depression and conduct disorder. *Journal of Consulting and Clinical Psychology*, 73, 38–46. 10.1037/0022-006X.73.1.38 [PubMed: 15709830]
- Kazdin AE (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology*, 3, 1–27. 10.1146/annurev.clinpsy.3.022806.091432
- Kelly JS, Langdon D, & Serpell L (2009). The phenomenology of body image in men living with HIV. *AIDS Care*, 21, 1560–1567. 10.1080/09540120902923014 [PubMed: 20024735]
- Kraemer HC, Wilson GT, Fairburn CG, & Agras WS (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, 59, 877–883. 10.1001/archpsyc.59.10.877 [PubMed: 12365874]
- McLean CP, Yeh R, Rosenfield D, & Foa EB (2015). Changes in negative cognitions mediate PTSD symptom reductions during client-centered therapy and prolonged exposure for adolescents. *Behaviour Research and Therapy*, 68, 64–69. 10.1016/j.brat.2015.03.008 [PubMed: 25812826]
- Peplau LA, Frederick DA, Yee C, Maisel N, Lever J, & Ghavami N (2009). Body image satisfaction in heterosexual, gay, and lesbian adults. *Archives of Sexual Behavior*, 38, 713–725. 10.1007/s10508-008-9378-1 [PubMed: 18712469]
- Pinto-Gouveia J, Carvalho SA, Palmeira L, Castilho P, Duarte C, Ferreira C, ... Costa J (2016). Incorporating psychoeducation, mindfulness and self-compassion in a new programme for binge eating (BEfree): Exploring processes of change. *Journal of Health Psychology*. 10.1177/1359105316676628
- Powers MB, de Kleine RA, & Smits JA (2017). Core mechanisms of cognitive behavioral therapy for anxiety and depression: A review. *Psychiatric Clinics of North America*, 40, 611–623. 10.1016/j.psc.2017.08.010 [PubMed: 29080589]
- Rosen JC, & Reiter J (1996). Development of the body dysmorphic disorder examination. *Behaviour Research and Therapy*, 34, 755–766. 10.1016/0005-7967(96)00024-1 [PubMed: 8936758]
- Selig JP, & Preacher KJ (2009). Mediation models for longitudinal data in developmental research. *Research in Human Development*, 6, 144–164. 10.1080/15427600902911247
- Sheehan D, Lecrubier Y, Harnett Sheehan K, Janavs J, Weiller E, Keskiner A, ... Dunbar G (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry*, 12, 232–241. 10.1080/09540120600774354
- Smits JA, Julian K, Rosenfield D, & Powers MB (2012). Threat reappraisal as a mediator of symptom change in cognitive-behavioral treatment of anxiety disorders: A systematic review. *Journal of Consulting and Clinical Psychology*, 80, 624–635. 10.1037/a0028957 [PubMed: 22686124]
- Stears A, & Hames C (2014). Diagnosis and management of lipodystrophy: A practical update. *Clinical Lipidology*, 9, 235–259. 10.2217/clp.14.13
- Su Y-J, Carpenter JK, Zandberg LJ, Simpson HB, & Foa EB (2016). Cognitive mediation of symptom change in exposure and response prevention for obsessive-compulsive disorder. *Behavior Therapy*, 47, 474–486. 10.1016/j.beth.2016.03.003 [PubMed: 27423164]
- Tylka TL, & Andorka MJ (2012). Support for an expanded tripartite influence model with gay men. *Body Image*, 9, 57–67. 10.1016/j.bodyim.2011.09.006 [PubMed: 22036192]
- van den Berg P, Thompson JK, Obrowski-Brandon K, & Covert M (2002). The tripartite influence model of body image and eating disturbance. *Journal of Psychosomatic Research*, 53, 1007–1020. 10.1016/S0022-3999(02)00499-3 [PubMed: 12445590]
- Veale D (2004). Advances in a cognitive behavioural model of body dysmorphic disorder. *Body Image*, 1, 113–125. 10.1016/S1740-1445(03)00009-3 [PubMed: 18089145]

- Veale D, Gledhill LJ, Christodoulou P, & Hodsoll J (2016). Body dysmorphic disorder in different settings: A systematic review and estimated weighted prevalence. *Body Image*, 18, 168–186. 10.1016/j.bodyim.2016.07.003 [PubMed: 27498379]
- Wilson GT, Fairburn CC, Agras WS, Walsh BT, & Kraemer H (2002). Cognitive-behavioral therapy for bulimia nervosa: time course and mechanisms of change. *Journal of Consulting and Clinical Psychology*, 70, 267–274. 10.1037/0022-006X.70.2.26 [PubMed: 11952185]

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Figure 1.

Latent difference score mediation model with treatment, cognitive behavioral therapy for body image and self-care (CBT-BISC) versus enhanced treatment-as-usual (E-TAU) as the independent variable assessed at Time 1 (T_1), three coping strategy mediators represented by latent change scores from Time 1 to 2 (T_{1-2}), and body image disturbance as the outcome variable represented by a latent change score from Time 1 to 3 (T_{1-3}).

Table 1

Correlation Matrix of Body Image Outcome and Mediator Variables

Variable	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3
1.1 BIDQ, T1	—	.43**	.41*	.39**	.16	.21	.33*	.15	.27	-.02	-.11	.11
1.2 BIDQ, T2	.43**	—	.85**	-.002	.47**	.51**	.11	.48**	.57**	-.02	-.39*	.02
1.3 BIDQ, T3	.41**	.85**	—	-.04	.41*	.49**	.17	.46**	.65**	.08	-.42*	-.03
2.1 BICSI: Appearance Fixing, T1	.39**	-.002	-.04	—	.25	.21	.01	.11	-.14	.10	.32*	.11
2.2 BICSI: Appearance Fixing, T2	.16	.47**	.41*	.25	—	.81**	-.16	.37*	.31	.01	-.08	.08
2.3 BICSI: Appearance Fixing, T3	.21	.51**	.49**	.21	.81**	—	-.10	.21	.39*	-.08	-.23	.23
3.1 BICSI: Avoidance, T1	.33*	.11	.17	.01	-.16	-.10	—	.48**	.50**	.18	-.10	-.002
3.2 BICSI: Avoidance, T2	.15	.48**	.46**	.11	.37*	.21	.48**	—	.60**	-.01	-.22	-.27
3.3 BICSI: Avoidance, T3	.27	.57**	.65**	.14	.31	.39*	.50**	.60**	—	.10	-.37*	.06
4.1 BICSI: AR, T1	-.02	-.02	.08	.10	.01	-.08	.18	-.01	.10	—	.62**	.19
4.2 BICSI: AR, T2	-.11	-.39*	-.42*	.32*	-.08	-.23	-.10	-.22	-.37*	.62**	—	.15
4.3 BICSI: AR, T3	.11	.02	-.03	.11	.08	.23	-.002	-.27	.06	.19	.15	—

Note. T1 = Baseline timepoint; T2 = Posttreatment timepoint; T3 = 3-Month Follow-up timepoint; BIDQ = Body Image Disturbance

Questionnaire; BICSI = Body Image Coping Strategies Inventory; AR = Acceptance and Reappraisal.

**
 $p < .01$

*
 $p < .05$