The Effectiveness of Interventions Aiming to Promote Positive Body Image in Adults: A Systematic Review

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Highlights

- Positive body image interventions improve aspects of health and well-being.
- Fifteen studies, evaluating 13 interventions, were eligible for inclusion.
- The two interventions for men, rated as weak, did not improve positive body image.
- Strong and moderate quality interventions improved positive body image in women.
- Future interventions should target multiple components of positive body image.

Abstract

Theory suggests promoting positive body image (PBI) through interventions would have a significant impact on health and well-being. However, little is known about the effectiveness of existing interventions. This review aimed to identify and assess the evidence of effectiveness of interventions to increase PBI in adults. Database searches were conducted using CINAHL Plus, Medline, PsychINFO, Wiley Online Library, and SCOPUS. Application of inclusion criteria and data extraction were conducted by two reviewers. Methodological quality was assessed using the Effective Public Health Practice Project Quality Assessment Tool, and narrative synthesis was conducted. Fifteen studies, evaluating 13 interventions, were included. Three studies, evaluating one online writing-based functionality intervention, were judged to have strong methodological quality and had evidence of improving body appreciation, body esteem, and functionality satisfaction. Six moderate quality studies found interventions using intuitive eating, CBT, self-compassion, and exercise improved PBI. There was limited evidence of effectiveness of interventions for men, suggesting future research is needed to better understand PBI mechanisms in men. Lack of heterogeneity of outcome

measures is discussed as a limitation. Findings suggest existing interventions are effective at increasing aspects of PBI among women and support the development of interventions that target multiple components of PBI.

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Key Words: Systematic review; intervention; positive body image; body appreciation; body image flexibility; body functionality.

1. Introduction

Body dissatisfaction, a prevalent issue among adolescent and adult women and men (Karazsia, Murnen, & Tylka, 2017; Tiggemann, 2004), is associated with negative outcomes such as low self-esteem (Grossbard, Lee, Neighbors, & Larimer, 2009), depression (Brechan & Kvalem, 2015) and the development of eating disorders (Stice & Shaw, 2002). Consequently, research and clinical practice have traditionally focused on reducing negative body image (Halliwell, 2015; Tylka, 2011, 2012; Tylka & Wood-Barcalow, 2015b). Interventions that target body dissatisfaction are effective at preventing the development of eating disorders, reducing internalisation of cultural appearance ideals, and increasing body satisfaction (Bearman, Stice, & Chase, 2003; Irving, DuPen, & Berel, 1998; Rosen, Cado, Silberg, Srebnik, & Wendt, 1990; Stice, Chase, Stormer, & Appel, 2001; Stice & Shaw, 2002). However, evidence indicates that positive body image is also an important target for intervention (Albertson, Neff, & Dill-Shackleford, 2015; Tylka & Wood-Barcalow, 2015b).

Positive body image is not the absence of negative body image, or one end of a body image continuum (Webb et al., 2015); evidence suggests it is an independent and multifaceted construct (Tylka & Wood-Barcalow, 2015b) that forms an important aspect of a broader experience of embodiment (Piran, 2016). Menzel and Levine (2011) conceptualise

positive body image as having three core components: appreciation of the appearance and function of the body; being aware and attentive to the body's needs; and the ability to process appearance-related messages in a self-protective manner. These core components are related to one another, but also function somewhat independently (Webb, Butler-Ajibade, & Robinson, 2014).

Positive body image is distinct from negative body image and is associated with additional variation in well-being after accounting for negative body image (Tylka & Wood-Barcalow, 2015a). Indeed, positive body image is associated with both psychosocial and physical well-being, including increased self-esteem, self-compassion, life satisfaction, and health behaviours (Halliwell, 2015; Tylka & Wood-Barcalow, 2015a). For example, body appreciation, a key component of positive body image, has been found to predict adaptive eating behaviours (Andrew, Tiggemann, & Clark, 2016) and to protect women from the negative effects of being exposed to sociocultural appearance ideals (Halliwell, 2013). Furthermore, evidence suggests that focussing on body functionality can protect individuals from negative appearance-related thoughts and comments from others (Tylka & Wood-Barcalow, 2015b).

This body of work suggests that, to have a positive impact on many aspects of health and well-being, it is necessary to promote positive body image rather than simply reduce negative body image (Webb et al., 2015). In support of this, there is evidence that positive body image can be fostered through interventions (Albertson et al., 2015; Tylka & Wood-Barcalow, 2015b). Thus, promoting positive body image has become an important focus within the field.

A number of effective interventions that target negative body image include elements that are thought to foster positive body image (Tylka & Wood-Barcalow, 2015b). For example, cognitive dissonance-based interventions include activities such as positive self-affirmations and writing exercises (Tylka & Wood-Barcalow, 2015b; Halliwell & Diedrichs, 2019; Piran, 2015), and evidence suggests that aspects of media literacy interventions increase skills that can protect against the negative impact of exposure to appearance ideals in the media (Cook-Cottone, Kane, Keddie, & Haugli, 2013; Piran, 2015; Tylka & Wood-Barcalow, 2015b). Additionally, it is thought that yoga-based interventions can promote body appreciation (Cook-Cottone et al., 2013; Scime & Cook-Cottone, 2008; Tylka & Wood-Barcalow, 2015b). Further, a small number of interventions have been designed to promote specific aspects of positive body image, such as body functionality (e.g., Alleva, Martijn, Van Breukelen, Jansen, & Karos, 2015; Buchholz, Mack, McVey, Feder, & Barrowman, 2008; Franko, Cousineau, Rodgers, & Roehrig, 2013).

Key to capturing effectiveness is the challenge of measuring positive body image. Because interest in positive body image has largely formed in the last 15 years (Avalos, Tylka, & Wood-Barcalow, 2005; Scime & Cook-Cottone, 2008), the development and validation of specific outcome measures is less advanced than that of negative body image. Webb, Wood-Barcalow, and Tylka (2015) explained that, originally, positive body image was measured using the Body esteem Scale (BES; Buchholz et al., 2008; Franko et al., 2013) and the Appearance Evaluation Subscale of the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Brown, Cash, & Mikulka, 1990; Cash, 2000). These measures deviate from current conceptualisations of positive body image as they equate positive body image to a favourable overall evaluation of the appearance (Webb et al., 2015). However, these two scales are distinct from the majority of measures of negative body image because they focus on broad

aspects of body evaluation and not just on body shape and size. Therefore, these two measures do tap into aspects of positive body image and they have been used in research to evaluate interventions that aim to promote positive body image, particularly in the absence of positive body image-specific measures.

Subsequently, a number of more sophisticated positive body image-specific outcome measures have been developed. These are sensitive to the multiple components of positive body image (Webb et al., 2015) and account for positive body image as a separate construct to negative body image. In 2015, Webb et al. recommended 18 validated outcome measures, assessing 11 psychological constructs related to the core components of positive body image (i.e., body appreciation, positive rational acceptance coping, body image flexibility, body functionality, attunement, body pride, positive and self-accepting body talk, body sanctification, broad conceptualisation of beauty, and body acceptance by others). Although these recommended measures are considered the most appropriate for assessing positive body image, evaluation-based measures provided a way of measuring positive body image before these more suitable tools were available. Furthermore, although the Body Appreciation Scale-2, the most recent measure of a core component of positive body image, has recently been adapted for children (Halliwell, Jarman, Tylka, & Slater, 2017), measuring other aspects of positive body image in children still poses a significant challenge (Webb et al., 2015). Therefore, evaluation-based measures still hold value when examining the evidence of effectiveness of interventions at improving some aspects of positive body image.

In summary, although there is considerable evidence of the effectiveness of interventions at reducing body dissatisfaction in adults, little is known about the effectiveness of existing interventions at promoting positive body image (Halliwell, 2015). A comprehensive understanding of the current state of evidence in this field is needed to inform the

development of future positive body image-specific interventions and identify which components of existing interventions target the underlying mechanisms of positive body image. This is timely, and now feasible, given that a number of outcome measures have recently been developed to assess specific components of positive body image in adults.

The aim of this systematic review was to identify and assess the evidence of effectiveness of existing interventions that aim to promote or increase components of positive body image in adults. Because various types of interventions are thought to have the potential to promote positive body image, intervention studies that measured positive body image as a primary or secondary outcome were considered eligible for review. Additionally, studies were included if they used an adult population, included a comparison group, and measured an aspect of positive body image pre- and post-intervention.

2. Method

This systematic review was conducted in accordance with the Cochrane Handbook for Systematic Reviews (Green & Higgins, 2011) and followed the PRISMA statement for reporting systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009). A protocol is available on request. PROSPERO registration: CRD42018100703. Most studies included in the review examined intervention effectiveness (i.e., they were conducted in real-word settings), rather than intervention efficacy (i.e., conducted under ideal conditions; Singal, Higgins, & Waljee, 2014). Therefore, the review aimed to evaluate the evidence of effectiveness of interventions at improving positive body image in adults.

2.1. Search Strategy

Database searches of CINAHL Plus, Medline, PsychINFO, Wiley Online Library, and SCOPUS were conducted up to 03/08/2018. There were no restrictions on date of publication. Grey literature searches were also conducted in relevant journals (e.g., *Body Image*,

International Journal of Eating Disorders), and reference lists of included papers were searched for additional studies. Non-published works, which have not undergone peer-review, were not included because they can increase the risk of bias within a review (Ferguson & Brannick, 2012). The data screening process is presented as a PRISMA flow-chart in Figure 1.

Databases were searched using the following search string: "Positive body image" OR "body image" OR "body satisfaction" OR "body appreciation" OR "body functionality" AND "intervention" OR "program.*"

2.2. Eligibility Criteria

The authors included articles that were published in English, in peer-reviewed journals and reported quantitative data. Additionally, we adhered to the following PICO criteria (Richardson, Wilson, & Hayward, 1995):

2.2.1. Population.

Studies needed to include an adult population, defined as having a sample mean age of ≥ 18 years old. One eligible study (Rodgers et al., 2018) included participants under 18 (*M*age = 18.36, *SD* = 1.34); all other studies included only participants above 18 years old. To maintain a clear focus of the review, and due to restrictions in relation to article length, 10 studies using samples of children and adolescents were excluded and will be presented in a separate systematic review.

2.2.2. Intervention.

*S*tudies needed to include an intervention using physical, educational, and/or psychosocial approaches.

2.2.3. Comparison.

Studies needed to include a comparison group, because single sample studies increase risk of bias and make it difficult to determine cause and effect (Kendall, 2003). However, randomisation, which can be difficult to implement within social science intervention research, was not a requirement (Deeks et al., 2003).

2.2.4. Outcomes.

Studies needed to include a validated measure of one or more components of positive body image (inclusive of positive appearance evaluation or body esteem), as a primary or secondary outcome, at pre- and post-intervention. This was determined following guidance from Webb et al. (2015), who outline validated outcome measures that assess facets of positive body image. Additional searches were carried out of studies that administered outcome measures at pre- and post-intervention to identify measures that were validated after the publication of this guidance, identifying one outcome measure: the Functionality Appreciation Scale (Alleva, Tylka, & Kroon Van Diest, 2017).

2.3. Data Extraction

Data extraction was conducted independently by two reviewers, following guidance from the Cochrane Handbook for Systematic Reviews of Interventions (Green & Higgins, 2011). Data were extracted in relation to study design, participant characteristics, intervention, outcome measures, and results (see Table 1).

2.4. Methodological Quality Assessment

Methodological quality assessment for each study was carried out by two reviewers using the Quality Assessment Tool for Quantitative Studies, developed by the Effective Public Health Practice Project (EPHPP; Thomas, Ciliska, Dobbins, & Micucci, 2004). The EPHPP

provides an overall methodological quality rating of 'strong' (no weak ratings), 'moderate' (one weak rating) or 'weak' (more than one weak rating). These ratings are based on selection bias, study design, confounders, blinding, data collection method, and withdrawals and dropouts. The EPHPP was chosen because it is suitable for evaluating the methodological quality of RCTs, non-randomised controlled trials, and case control studies with pre-post designs (Jackson & Waters, 2005), and has been found to have excellent inter-rater reliability for overall scores when compared to the Cochrane Collaboration Risk of Bias Tool (Armijo-Olivo, Stiles, Hagen, & Biondo, 2012; Higgins et al., 2011). Additionally, it has established construct and content validity (Jackson & Waters, 2005), and is reported to be suitable for reviews of effectiveness (Deeks et al., 2003).

2.5. Appraisal of Intervention Effectiveness

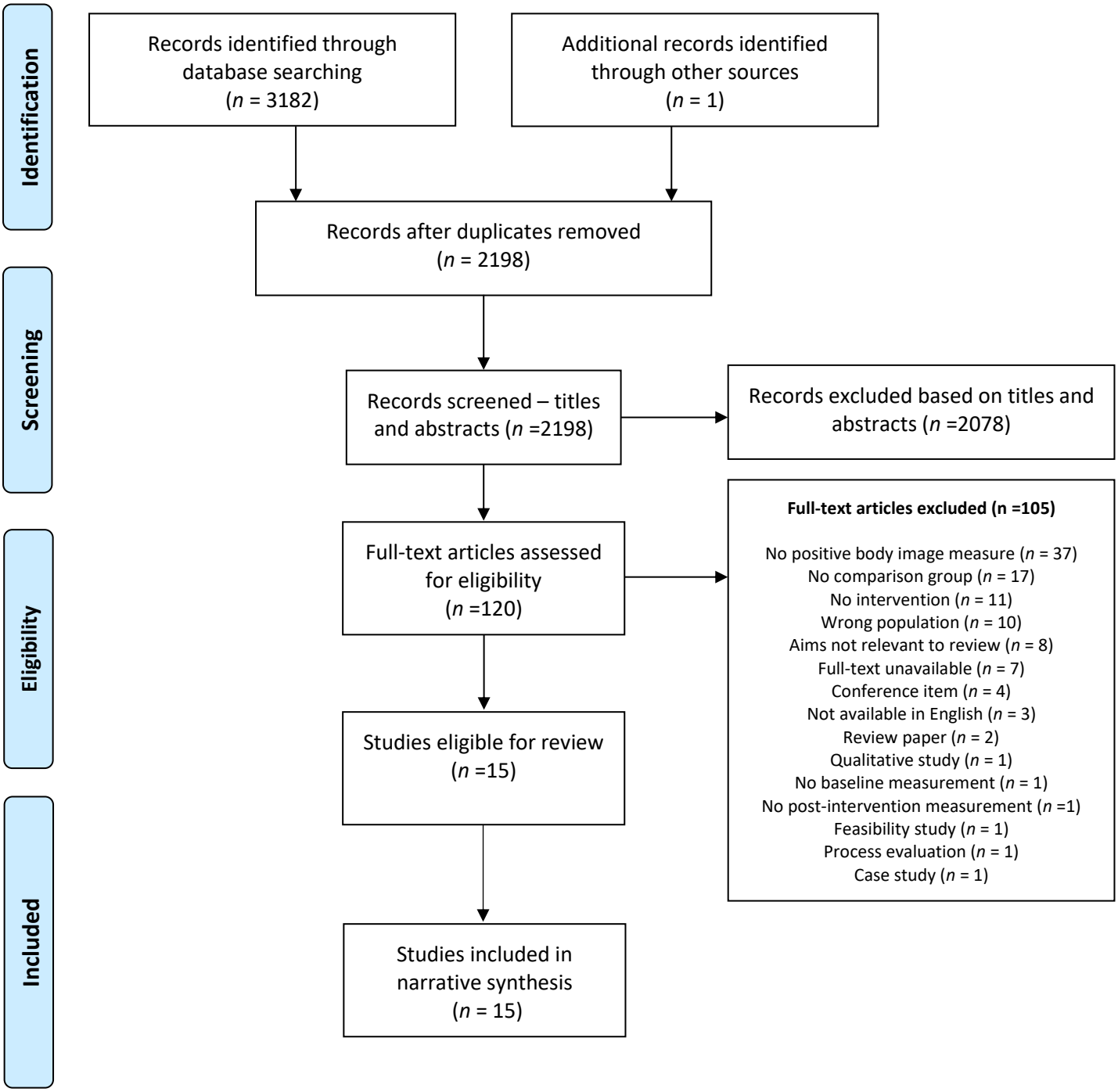
Interventions were considered effective when there was a statistically significant improvement in a measure of positive body image for the intervention group, pre-post, compared to the control group and in relation to methodological quality, determined using the EPHPP (Thomas et al., 2004). Where possible, effect sizes were calculated using Cohen's *d* by examining group differences divided by the pooled standard deviation (Rosnow & Rosenthal, 1996). Effect sizes were interpreted as small $d = 0.20$, medium $d = 0.50$ and large $d = 0.80$ (Morris, 2008) (see Table 1).

2.6. Synthesis of Results

Samples consisted of both men and women, as well as individuals with different medical conditions (e.g., breast cancer, arthritis). Additionally, while some studies sampled participants from the general population, others included those with pre-existing body dissatisfaction. Therefore, the studies were heterogeneous and difficult to compare directly. The identified interventions also varied greatly in approach, content, delivery, and length, and

eight different outcome measures were used to assess constructs of positive body image. For this reason it was not suitable to pool data and carry out a meta-analysis; instead, a narrative synthesis was conducted (Mays, Pope, & Popay, 2005; Ryan, 2014). Synthesis of results is presented in relation to study and intervention characteristics, intervention effectiveness, and methodological quality.

Figure 1. PRISMA Flow-Diagram of Screening Process for Review



3. Results

Fifteen peer-reviewed journal articles, evaluating 13 different interventions, were identified as relevant for the review. Detailed information about study characteristics, including the sample, intervention, outcome measures, and results are presented in Table 1.

3.1. Study Characteristics

The studies took place in six countries: seven in the USA (Albertson et al., 2015; Annesi, 2005; Bush, Rossy, Mintz, & Schopp, 2014; Pinto, Clark, Maruyama, & Feder, 2003; Rodgers et al., 2018; Toole & Craighead, 2016; Wolfe & Patterson, 2017), three in the UK (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Jankowski et al., 2017), two in Portugal (Duarte, Pinto-Gouveia, & Stubbs, 2017; Pinto-Gouveia et al., 2017), and one study in Australia (Mellor, Connaughton, McCabe, & Tatangelo, 2017), Iran (Ahmadi, Abbaspoor, Behroozy, & Malehi, 2017), and the Netherlands (Alleva, Martijn, et al., 2015). There was significant variation in sample size between the studies, ranging from 20 to 274 participants (*M* = 105.7). All studies were published within the past 15 years (2003-2018), with over half published in the past two years (*n* = 9).

3.2. Sample Characteristics

Mean ages of participants ranged from 18 to 54 years. Two studies were conducted with men-only samples; one with men in midlife, defined as 40 - 65 years (Mellor et al., 2017), and one with undergraduate men (Jankowski et al., 2017). Additionally, Rodgers et al. (2018) conducted their study with a mixed-sample of emerging adults; however, only 26% were men. In this study, participants were recruited from high schools and a university; the mean age was 18.36 (*SD* = 1.34), with almost 70% (*n* = 186) recruited from the university. Thus, most of the sample were classified as adults. Nonetheless, most studies (*n* = 12) used women-only samples (Ahmadi et al., 2017; Albertson et al., 2015; Alleva, Diedrichs, Halliwell, Martijn, et

al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015; Annesi, 2005; Bush et al., 2014; Duarte et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003; Toole & Craighead, 2016; Wolfe & Patterson, 2017).

Seven studies used participants from the general population, while eight used populations with specific medical conditions or pre-disposing factors, including women with infertility (Ahmadi et al., 2017), rheumatoid arthritis (Alleva, Diedrichs, Halliwell, Peters, et al., 2018), binge eating disorder (BED) (Duarte et al., 2017; Pinto-Gouveia et al., 2017), a previous diagnosis of breast cancer (Pinto et al., 2003), and body dissatisfaction (Alleva, Martijn, et al., 2015; Toole & Craighead, 2016). Therefore, the populations included were heterogeneous and not directly comparable.

3.3. Intervention Characteristics

The 15 studies evaluated 13 different interventions. Studies using the same interventions were Alleva and colleagues, who used the same online writing-based intervention (i.e., *Expand Your Horizon*) in three studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), slightly adapting it for women with rheumatoid arthritis in one (Alleva, Diedrichs, Halliwell, Peters, et al., 2018), and Albertson et al. (2015) and Toole and Craighead (2016), who used the same podcast-based self-compassion meditation intervention. However, Toole and Craighead used a shorter study duration to reduce attrition. Detailed information about the interventions is presented in Table 2.

The most commonly used intervention approaches were self-compassion-based (*n* = 5) (Albertson et al., 2015; Duarte et al., 2017; Pinto-Gouveia et al., 2017; Rodgers et al., 2018; Toole & Craighead, 2016), functionality-based (*n* = 3) (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), and

most employed some aspects of psychoeducation. Eight were self-directed (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015; Annesi, 2005; Pinto et al., 2003; Rodgers et al., 2018; Toole & Craighead, 2016; Wolfe & Patterson, 2017) and seven were group-based (Bush et al., 2014; Duarte et al., 2017; Jankowski et al., 2017; Mellor et al., 2017).

Two studies evaluated manualised group-based interventions for men. Jankowski and colleagues (2017) used a cognitive dissonance approach, while Mellor and colleagues (2017) used psychoeducation covering health, physical, and appearance changes in midlife. Both consisted of weekly 90-minute sessions, taking place over two and four weeks, respectively.

Two studies used individual exercise interventions; one independent (Annesi, 2005) and one supervised (Pinto et al., 2003). Both involved sessions three times a week for 12-weeks. One study (Wolfe & Patterson, 2017) evaluated two workbook-based interventions using cognitive restructuring and gratitude approaches; workbook activities were completed daily for two weeks.

There were three group-based programmes for women, using CBT (Ahmadi et al., 2017); mindfulness and psychoeducation for intuitive eating (Bush et al., 2014); and psychoeducation, mindfulness, and self-compassion for BED (Pinto-Gouveia et al., 2017). Intervention doses differed: the CBT-based programme consisted of eight sessions of 60-minutes for two months, the BED intervention had 12 × 2.5-hour sessions, and the intuitive eating intervention consisted of 10 sessions over 10 weeks.

Additionally, four interventions from six studies used self-directed, online delivery. One, used in three studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), was a writing-based functionality intervention, consisting of 15-minute writing tasks every two days for one week. The other

three used self-compassion approaches: two used three 20-minute meditation podcasts (Albertson et al., 2015; Toole & Craighead, 2016) from the Mindful Self-Compassion Programme (Neff & Germer, 2013). However, Albertson et al. asked participants to listen to the podcasts daily for three weeks, whereas Toole and Craighead provided the three podcasts over the course of one week. The third (Duarte et al., 2017) used mindfulness audio-exercises over four weeks, alongside a website based on self-compassion for BED, and one 2.5-hour psychoeducational group session. Finally, Rodgers et al. (2018) evaluated a self-compassion and psychoeducation-based mobile app, with daily use for six-weeks.

3.4. Positive Body Image-Related Outcome Measures Used in the Studies

Eight validated outcome measures were used to assess components of positive body image (see Table 4 for details).

Body appreciation (assessed using BAS and BAS-2) was the most commonly measured component of positive body image, utilised in nine studies (BAS, *n* = 7; BAS-2, *n* = 2). Body esteem was the second most measured construct, used in six studies (BES, *n* = 5; BESAA, *n* = 1). Further, body image flexibility, measured using the BI-AAQ (Ferreira, Pinto-Gouveia, & Duarte, 2011; Sandoz, Wilson, Merwin, & Kellum, 2013), was employed by three studies; all using self-compassion-based interventions. Three outcome measures were classified in this research as assessing functionality: the FAS (Alleva et al., 2017) was used in one study, the Body Surveillance subscale of the OBCS (McKinley & Hyde, 1996) was used in two studies (Alleva et al., 2015; Toole & Craighead, 2016), and the Physical Condition subscale of the BES was used in two studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Martijn, et al., 2015). Finally, the Appearance Evaluation subscale of the MBSRQ, was used to measure body satisfaction in one study (Ahmadi et al., 2017).

3.5. Methodological Quality of Studies

The EPHPP assessment (Thomas et al., 2004; see Table 3) revealed that the methodological quality of studies was mixed. Six studies were classified as weak, implying a high risk of bias (Albertson et al., 2015; Duarte et al., 2017; Jankowski et al., 2017; Mellor et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003), six as moderate (Ahmadi et al., 2017; Annesi, 2005; Rodgers et al., 2018; Toole & Craighead, 2016; Wolfe & Patterson, 2017) and three (by the same author and using the same intervention) as strong, implying a low risk of bias (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015).

All studies received a strong rating for their study design, which were RCTs (*n* = 11) (Ahmadi et al., 2017; Albertson et al., 2015; Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015; Duarte et al., 2017; Mellor et al., 2017; Rodgers et al., 2018) or non-randomised controlled studies (*n* = 4) (Bush et al., 2014; Jankowski et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003), and a strong rating for data collection methods, because they used positive body image-related outcome measures with evidence of validity and reliability.

Lack of blinding was a limitation for most studies. Only one study (Alleva, Diedrichs, Halliwell, Peters, et al., 2018) received a strong rating for blinding; indicating that the experimenters were blinded to the intervention status of participants, and participants were blinded to the research question. Two studies received a moderate rating (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Martijn, et al., 2015) because they only reported that participants were unaware of the research question. However, the majority either reported that experimenters and/or participants were not blinded or did not report any information on this (Ahmadi et al., 2017; Albertson et al., 2015; Annesi, 2005; Bush et al., 2014; Jankowski

et al., 2017; Mellor et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003; Rodgers et al., 2018; Toole & Craighead, 2016; Wolfe & Patterson, 2017).

The impact of methodological quality is discussed further in relation to the reliability of evidence of the interventions' effectiveness.

3.6. Effectiveness of Interventions at Improving Positive Body Image

3.6.1. Effectiveness of intervention type.

The three strong quality studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), which all evaluated the same online, functionality-based writing intervention, found significant improvements in positive body image. Furthermore, all but one intervention from moderate quality studies (Wolfe & Patterson, 2017) found significant improvements in positive body image. Ten studies collected follow-up data, with strong quality studies finding improvements maintained at 1-week (Alleva, Martijn, et al., 2015) and 1-month (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018), and moderate studies at 1-month (Ahmadi et al., 2017) and 12-weeks (Rodgers et al., 2018). Effect sizes of strong quality studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015) ranged from small to large (d = 0.24 – 8.21) at post-intervention, and small to medium (d = 0.20 - 0.63) at follow-up. Effect sizes of moderate studies ranged from small to large (d = 0.03 - 8.10) post-intervention and were small (d = 0.25 – 4.6) at follow-up.

Effectiveness of interventions is presented in relation to mode of delivery (e.g., group-based and online) and intervention approach (e.g., CBT, exercise, online), and methodological quality and evidence of effectiveness at improving positive body image is discussed. Following

this, evidence of effectiveness is discussed in relation to positive body image outcome measures used in the studies.

Five interventions employed group-based approaches. None were of strong methodological quality, but two were moderate (Ahmadi et al., 2017; Bush et al., 2014). Here, Ahmadi et al. (2017) found significant improvements in appearance evaluation, with a very large effect size (*d* = 8.21), which was maintained at 1-month follow-up. Additionally, Bush et al. (2014) found significant improvements in body appreciation pre-post, with a large effect size (*d* = 1.15). Conversely, a weak quality study by Pinto-Gouveia et al. (2017) found significant improvements in body image flexibility, which were maintained at six months, from their mindfulness and self-compassion intervention. Their study had significant risks of attrition bias, lack of blinding, and confounding variables, which make it difficult to interpret findings with certainty.

Neither of the group interventions designed for men (Jankowski et al., 2017; Mellor et al., 2017) significantly improved positive body image, and both received a weak quality rating. Interestingly, Jankowski and colleagues, who adapted a cognitive dissonance-based intervention that is well established for women, did find significant improvements in body appreciation when using per-protocol analysis. However, there was a high attrition rate (> 40%), and intention-to-treat analysis found no significant differences between groups. Additionally, both studies had a lack of blinding, and Mellor et al. (2017) did not sufficiently control for important baseline group differences.

The other seven interventions, all for women or mixed-groups, were self-directed. One 12-week exercise intervention received a moderate quality rating (Annesi, 2005), finding significant improvements in the intervention group for the Weight Concern and Physical Condition BES subscales (Franzoi & Shields, 1984), with medium effects (*d*s = 0.69; 0.49). A

second exercise intervention (Pinto et al., 2003), of a similar format, found the same improvements in body esteem; however, this study was judged to be of weak quality based on a lack of blinding, high attrition rate, and risk of confounding variables. Therefore, the evidence of effectiveness is questionable because of a significant risk of bias.

Three self-directed interventions were completed online; all of which significantly improved some aspect of positive body image. A functionality-based writing intervention was used in three studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015) and received a strong quality rating, suggesting a low risk of bias within the results. These studies found significant improvements in body appreciation and satisfaction with functionality in the intervention group, relative to the control. Effect sizes were small to medium for body appreciation (*d*s = 0.68, 0.24, 0.60). However, for functionality satisfaction, they were small to medium when measured using the BES Physical Condition subscale (*d*s = 0.62, 0.26) (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Martijn, et al., 2015), and large when using the FAS (*d* = 0.81) (Alleva, Diedrichs, Halliwell, Peters, et al., 2018). These improvements were maintained at one week (Alleva, Martijn, et al., 2015) and one month (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018).

The two other online interventions employed a self-compassion approach. Of these, two studies had a moderate methodological quality, and found significant increases in aspects of positive body image as a result of the intervention: Rodgers et al. (2018) found an improvement in body esteem, which was maintained at 12-weeks, with small effect sizes (*d*s = 0.32, 0.25, respectively) from a mobile app for emerging adults. However, they found no significant improvements in body image flexibility. Additionally, Toole and Craighead (2016)

found that a podcast intervention increased body appreciation and decreased body surveillance with small effect sizes (*d* = 0.03, 0.22). This intervention was also evaluated in a weak quality study by Albertson et al. (2015), who found improvements in body appreciation that were maintained at three months. This study had a high drop-out rate and there was a lack of blinding; therefore, the findings should be interpreted with caution.

Caution should also be exercised when interpreting the evidence of effectiveness from Duarte et al. (2017), who also received a weak rating for blinding and selection bias. Their findings suggested that an online and group-based self-compassion mindfulness exercises (for individuals with BED), significantly improved body image flexibility.

Finally, a study of moderate quality (Wolfe & Patterson, 2017) evaluated two self-directed, workbook-based interventions. No significant improvements in positive body image were found for the cognitive restructuring intervention. However, the gratitude-based intervention found a significant improvement in the BES Weight Concerns subscale, with a small effect (*d* = 0.24). Conversely, there were no significant improvements in body appreciation for either intervention.

3.6.2. Effectiveness at improving aspects of positive body image.

3.6.2.1. Body appreciation.

Body appreciation was measured in eight studies. Three studies of strong methodological quality, using the same online writing-based functionality intervention (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), found significant improvements that were maintained at one week (Alleva, Martijn, et al., 2015) and one month (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018), with small to medium effect sizes. Moreover, two studies of moderate methodological quality found improvements with small

to large effect sizes. These were Bush et al.'s (2014) group-based mindfulness intuitive eating intervention and Toole and Craighead's (2016) self-compassion podcast meditation intervention. In addition, one study of weak quality (Albertson et al., 2015) also found improvements using the same intervention as Toole and Craighead.

Conversely, three studies (Jankowski et al., 2017; Mellor et al., 2017; Wolfe & Patterson, 2017) found no improvements in body appreciation. Wolfe and Patterson (2017), who received a moderate quality rating, used cognitive restructuring and gratitude workbook interventions. Further, Mellor et al. (2017) and Jankowski et al. (2017) used group-based interventions for men. However, both studies were judged to be of weak methodological quality.

3.6.2.2. Body image flexibility.

Three studies measured body image flexibility (Duarte et al., 2017; Pinto-Gouveia et al., 2017; Rodgers et al., 2018), all using self-compassion approaches. Rodgers et al. (2018) found no improvements in body image flexibility as a result of their mobile app intervention in a study with a moderate quality rating. The other two studies found significant improvements, with medium effect sizes, which were maintained at one (Duarte et al., 2017) and six months (Pinto-Gouveia et al., 2017). Both studies were assessed as having a weak methodological quality due to selection bias, lack of blinding (Duarte et al., 2017; Pinto-Gouveia et al., 2017), and high attrition (Pinto-Gouveia et al., 2016). Therefore, it should be concluded that there is currently limited evidence of effectiveness of self-compassion-based interventions at improving body mage flexibility.

3.6.2.3. Body functionality.

Four studies, using two interventions, measured body functionality. All found significant improvements. Three studies, using an online writing-based functionality

intervention (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), were of strong methodological quality. These studies found small to medium effects when using the BES Physical Condition subscale to measure functionality, and a large effect size when the FAS was used, with improvements maintained at follow-up in all studies. Additionally, Toole and Craighead (2016), who received a moderate quality rating, used body surveillance to measure functionality (whereby lower surveillance corresponds to higher functionality). They found body surveillance decreased, with a small effect size, from pre-post in their intervention.

3.6.2.4. Body esteem.

Six studies measured body esteem. Two, using an online writing-based functionality intervention, were of a strong methodological quality, finding improvements that were maintained at one month (Alleva, Martijn, et al., 2015) and three months (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018). Furthermore, three studies of moderate quality found improvements in body esteem using workbook-based gratitude (Wolfe & Patterson, 2017), mobile app (Rodgers et al., 2018) and independent exercise (Annesi, 2005) interventions. One study (Pinto et al., 2003) of weak methodological quality also found improvements in body esteem as a result of a self-directed, supervised exercise intervention. Overall, particularly given the overall quality of these studies, the evidence suggests that these interventions improve body esteem.

3.6.2.5. Appearance evaluation.

Appearance evaluation was assessed in one moderate quality study (Ahmadi et al., 2017) with Iranian women with body dissatisfaction and infertility issues. This study found a significant increase in appearance evaluation in the intervention group, compared to the control, which was maintained at one month, with large effect sizes.

4. Discussion

To the best of our knowledge, this is the first systematic review to examine evidence of effectiveness of existing interventions at promoting positive body image in adults. Fifteen studies were eligible for the review, evaluating 13 interventions. Just three studies, using the same intervention, were judged to be of strong methodological quality. Furthermore, six studies were found to be of moderate quality. Findings are discussed in relation to evidence of effectiveness, methodological quality, and recommendations for promoting positive body image in adults.

Firstly, the intervention with the best evidence of effectiveness was an online, writing-based functionality intervention (i.e., *Expand Your Horizon*), used in three studies (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015). Encouragingly, these studies showed the intervention significantly increased aspects of positive body image in women, including body appreciation, satisfaction with body functionality, and body esteem; improvements were maintained at one month (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018). These findings suggest the intervention has considerable potential for promoting positive body image in adult women. In support of this, empirical research finds that women who focus more on body functionality experience greater levels if body appreciation (Avalos & Tylka, 2006). This intervention has evidence of effectiveness with women with body dissatisfaction from the general population and with rheumatoid arthritis. Future research could evaluate its effectiveness with other chronic conditions, in different cultures, and with longer follow-up periods.

Secondly, several studies of moderate methodological quality also found significant improvements in positive body image as a result of their interventions. For example, independent exercise and gratitude-based workbook interventions significantly improved aspects of body esteem (Annesi, 2005; Wolfe & Patterson, 2017). Additionally, two self-directed compassion-based interventions found improvements in body esteem using a mobile app (Rodgers et al., 2018) and body appreciation using meditation podcasts (Toole & Craighead, 2016). Furthermore, there were two effective group-based interventions: a CBT-based intervention (Ahmadi et al., 2017), which found improvements in appearance evaluation, and a mindfulness-based intuitive eating programme (Bush et al., 2014) that found improvements in body appreciation. Interestingly, these group-based interventions achieved the largest effect sizes of the moderate or strong quality studies. This echoes findings from a meta-analysis of stand-alone body image interventions (Alleva, Sheeran, Webb, Martijn, & Miles, 2015), which found group interventions have significantly larger improvements on body image than individual interventions (Alleva, Sheeran, Webb, Martijn, & Miles, 2015). This suggests that being part of a group may enhance the effectiveness of interventions; however, it is important to note that Ahmadi et al. (2017) obtained a small sample size (n = 24), which may be associated with the very large effect sizes achieved from their intervention (Slavin & Smith, 2009).

Another notable finding was that the majority of interventions were used with women, with all but one of the strong or moderate quality studies (Wolfe & Patterson, 2017) finding improvements in positive body image. Conversely, the two men-only interventions were judged to have a weak methodological quality, with neither finding promising improvements in positive body image. One moderate quality study (Rodgers et al., 2018) did find improvements in body esteem in a mixed-gender sample; however, it is difficult to assess

the impact of this intervention on young men because only a quarter of participants were men (total sample = 274), and results were not presented by gender. While there is relatively good evidence that existing interventions are effective at increasing positive body image in adult women, the same cannot be said for interventions for adult men. In line with this, Halliwell (2015) purports that we currently know relatively little about the mechanisms underlying positive body image in men. Therefore, future research should first seek to understand how positive body image manifests in men, and whether this differs from women, in order to better inform the development of effective interventions for men. Additionally, previous research has found that men generally score higher on measures of body appreciation than women (Swami, Hadji-Michael, & Furnham, 2008; Tylka, 2013); therefore, it may also be useful to explore the relevance of targeting positive body image through interventions developed for men, and whether aspects other than body appreciation may be more pertinent for this population.

On a different note, although the effect sizes were not as large as group-based interventions, the review also found that strong and moderate quality online interventions had evidence of effectiveness. These online interventions included a writing-based functionality approach (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015), a psychoeducation and self-compassion-based mobile app (Rodgers et al., 2018), and self-compassion podcast meditations (Toole & Craighead, 2016).

Furthermore, these online interventions were found to be effective at increasing a number of components of positive body image, including body appreciation, body esteem, satisfaction with functionality and decreasing body surveillance. These findings hold promise

for the use and development of online interventions, which may be more cost-effective and accessible than group interventions.

With regards to methodological quality, only three studies were judged as strong (Alleva, Diedrichs, Halliwell, Martijn, et al., 2018; Alleva, Diedrichs, Halliwell, Peters, et al., 2018; Alleva, Martijn, et al., 2015). However, all moderate and strong quality studies found improvements in positive body image as a result of their intervention. Conversely, six of the studies were judged to be of weak quality (Albertson et al., 2015; Jankowski et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003). Of these, four reported significant improvement in positive body image (Albertson et al., 2015; Duarte et al., 2017; Pinto-Gouveia et al., 2017; Pinto et al., 2003)**,** with two reporting medium effect sizes (Duarte et al., 2017; Pinto-Gouveia et al., 2017), and one reporting a very large effect size (Pinto et al., 2003). As such, there may be a significant risk of bias within these results and the evidence of effectiveness should be questioned.

Authors of three studies utilising self-compassion found their interventions effective at improving body image flexibility (Albertson et al., 2015; Duarte et al., 2017; Pinto-Gouveia et al., 2017). These were of weak quality and the significant risk of bias within these studies, including selection bias, lack of blinding, and high attrition rates, makes it difficult to draw conclusions about the effectiveness of self-compassion at improving body image flexibility. However, body image flexibility is considered a key component of positive body image, which is found to be associated with positive body image and psychological well-being (Rogers, Webb, & Jafari, 2018), that correlates with self-compassion (Ferreira et al., 2011). Therefore, it may be beneficial to replicate these studies using a stronger methodology, in order to further explore the effectiveness of these interventions.

Lack of blinding was an issue across most studies and can impact the way that participants behave or complete outcome measures because they believe they are in a certain intervention group (Karanicolas, Farrokhyar, & Bhandari, 2010). While a number of studies in the review reported that the experimenter and/or participants were not blinded to the research question, the majority did not provide any information about whether blinding was used within their studies. Lack of blinding is not uncommon within social science research; given the nature of interventions it can be difficult to blind participants to the fact that they are in a control group. It is also challenging to blind outcome assessors and researchers who are often delivering the interventions. Interestingly, Alleva et al. (2018) overcame this by using online intervention software to randomise participants. This method may be utilised to increase the quality of blinding in future studies that employ an online approach.

Finally, most of the studies did report some evidence of effectiveness, regardless of methodological quality. For this reason, there may be publication bias across studies, whereby those with favourable findings are more likely to be accepted for publication. This potential bias may inflate the evidence of effectiveness of these interventions and therefore interpretation of review findings must be viewed critically.

4.1. Limitations

A number of limitations should also be considered. First, all but one study was carried out in Western cultures, and no effective interventions were carried out with adults over the age of 45. Therefore, very little is known about the effectiveness of interventions in older adults and with non-Western cultures. It would therefore be beneficial to evaluate the effectiveness of interventions with these groups.

Second, the heterogeneous nature of studies meant it was not feasible to conduct a meta-analysis, which made it difficult to draw firm conclusions about the effectiveness of

different types of interventions, or to make specific recommendations. However, within social sciences research there are often discrepancies between populations, study designs and interventions (Jackson & Waters, 2005).

Similarly, there was heterogeneity between both outcome measures and interventions, making it difficult to directly compare all studies. However, the review has shown that a variety of different intervention approaches and formats have the potential to increase aspects of positive body image in adult women. Given that positive body image is a multifaceted construct, a number of outcome measures have been developed to assess different aspects of it (e.g., body appreciation, body image flexibility, functionality). The use of these different measures has therefore enabled us to see which specific components of positive body image can be promoted through interventions, and the approaches that they use. In future, time should be given to examining whether positive body image-specific interventions could combine elements of these approaches in order to create a more holistic intervention that targets multiple facets of positive body image.

In conjunction with this, the review also included studies that measured body esteem and appearance evaluation. These constructs are not specific components of positive body image and are limited to measuring an individual's overall evaluation of their body. Therefore, it is difficult to determine the abilities of these interventions at improving positive body image. Nonetheless, given that positive body image is a relatively new concept, these measures provided a useful way of measuring positive body image when specific measures were not available. Furthermore, body esteem and appearance evaluation are found to be highly correlated to body appreciation (Avalos et al., 2005). Future research should consider using positive body image-specific measures, such as the BAS or BAS-2, in order to gain a better understanding of the effectiveness of these interventions.

Most positive body image-specific measures have been conceptualised and validated with samples of young, Caucasian college women (Avalos et al., 2005). These may be less appropriate for different cultures and genders. Validating or adapting these measures, following guidance on the translation and validation of body image outcome measures developed by Swami and Barron (2018), would improve face validity and enable positive body image to be measured cross-culturally. Notably, the BAS-2 has been validated with large numbers of men and women; Tylka and Wood-Barcalow (2015a) reported unidimensionality and invariance across sex, although the samples consisted mainly of U.S. college students.

On a different note, non-controlled studies were excluded from this systematic review because they can increase the likelihood of bias and confounding variables, and make it difficult to determine cause and effect (Kendall, 2003). However, studies using single samples hold value during the developmental stages of research, when examining the acceptability and feasibility of interventions. In particular, findings from studies can inform trial design and adaptations to interventions that decrease the likelihood of high attrition in later effectiveness or efficacy trials (Blatch-Jones, Pek, Kirkpatrick, & Ashton-Key, 2018).

Finally, it is possible that other interventions not included in this review could increase positive body image. For example, Piran (2015) suggests that cognitive dissonance-based interventions may foster positive body image by encouraging individuals to inhabit their bodies in a positive way and become attuned to their own experiences. However, no research examining cognitive dissonance-based interventions for women were eligible for the current review because they did not assess specific measures of positive body image or were conducted with adolescents. One study with adolescent girls found that participation in a dissonance-based body image intervention was associated with significantly improved body appreciation (Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015). However, a study by

Jankowski and colleagues (2017), that adapted a well-established cognitive dissonance-based intervention, was included. While per-protocol analysis did show significant improvements in body appreciation, there were high levels of withdrawals from the study, and intention-to-treat analysis revealed no significant differences between the conditions. Subsequently, it may be beneficial to further explore the potential of these interventions by measuring positive body image in both men and women (Piran, 2015).

4.2. Future Directions

Although the field of positive body image is less advanced than that of negative body image, there are now a number of validated outcome measures that assess different facets of positive body image. Consequently, future research should use these to assess constructs relating to positive body image, in order to increase consistency and homogeneity between studies and allow more accurate comparisons of the effectiveness of different interventions. One measure of positive body image, the Broad Conceptualization of Beauty Scale (Tylka & Iannantuono, 2016), has not yet been incorporated into interventions, which would be an important direction for future research.

On a different note, strong and moderate quality studies found improvements in positive body image were maintained from one week to 12 weeks. It would now be beneficial to examine how long-term these improvements are, and whether changes to dose or additional sessions can lead to sustained improvement in positive body image. For example, cognitive dissonance-based interventions have been found to reduce body dissatisfaction and eating disorder symptoms even at 3-years post-intervention (Stice, Marti, Spoor, Presnell, & Shaw 2008).

Finally, interventions in this review were found to significantly improve positive body image, however components such as positive rational acceptance coping, attunement, body pride, positive and self-accepting body talk, body sanctification, broad conceptualisation of beauty, and body acceptance for others were not examined by any of the studies. Although the overarching term 'positive body image' was used within the searches, and key journals and the reference lists of relevant papers were hand-searched for relevant articles, these specific components of positive body image were not explicitly used as search terms. Therefore, it is possible that interventions measuring these components of positive body image may not have been identified. Nonetheless, future research should consider how interventions could target other aspects of positive body image, and whether new interventions could be developed by incorporating approaches from existing interventions, to promote multiple components of positive body image.

4.3. Conclusion

The current review is the first to examine interventions that aim to improve positive body image and reveals strong evidence of effectiveness of an online writing-based functionality intervention at improving positive body image in adult women. Additionally, a number of other interventions from moderate quality studies, using different approaches, also have evidence of effectiveness for women. Conversely, our review identified only two studies evaluating interventions that aim to increase positive body image in men, with neither finding evidence of effectiveness. Therefore, the underlying mechanisms of positive body image in men, and whether men would benefit from interventions that aim to increase positive body image, should be further explored. Furthermore, studies using a number of interventions designed to promote aspects of positive body image were found to be of weak methodological quality. Therefore, these studies should be replicated using a stronger

methodology in order to gain better evidence of their effectiveness and efficacy, and to improve overall methodological rigor. In particular, this may include seeking ways to blind participants and researchers, reducing selection bias, and considering how to reduce high attrition; for example by utilising patient involvement work in the design of interventions or conducting acceptability and feasibility trials. It also highlights the importance of using consistent, positive body image-specific outcome measures to increase consistency and homogeneity. These findings may help to inform the development of future interventions, which aim to promote multiple components of positive body image in adult women. Future systematic reviews should consider interventions for children and young people.

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Table 1. Characteristics and results of studies included in review

Sample Characteristics			Intervention			Study Characteristics			Outcome Measures	Results		Methodological Quality
Author/ Year/ Location	**Gender/ age**	**Population**	**Type**	**Sample size**	**Delivery**	**Design**	**Follow-up**	**Comparison Group**	**Positive Body Image**	**Positive Body Image Outcomes**	**Effect Size (Cohen's *d*)**	**Global Rating**
Ahmadi et al. (2017) Iran	Female (*M*age = 28.1, *SD* = 4.04)	Infertile adult females with body image concerns	CBT-based	24	Group intervention	RCT	1 month	Assessment only control group	Multidimensional Body Self-Relations Questionnaire (MBSRQ) Appearance Evaluation subscale (Brown et al., 1990; Cash, 2000)	Significant improvement in appearance evaluation for intervention group pre-post, which was maintained at follow-up ($p <$ .05). No difference for control group.	Post *d* = 8.21 Follow-up *d = 4.6*	Moderate
Albertson et al. (2015) USA	Female (Int. *M*age = 36.42, *SD* = 1.31, Cont. *M*age = 38.42, *SD* = 1.42)	Adult females	Self-compassion-based meditation	228	Podcast, self-directed	RCT	3 months (int. group only)	Wait-list control group	Body Appreciation Scale (Avalos et al., 2005)	Significantly increased body appreciation pre-post in the intervention group, compared control group. Improvement was maintained at follow-up.	Post *d* = 0.37 (Not possible to calculate follow-up)	Weak
Alleva, Martijn, et al., (2015) Netherlands	Female (*M*age = 22.77, *SD* = 3.19)	Adult females with body dissatisfaction (score ≥ 90 on Body Shape Questionnaire)	Online functionality-based, structured writing intervention (*Expand Your Horizon*)	81	Online, self-directed	RCT	1 week	Active control group: online writing-based creativity training programme	BAS (Avalos et al., 2005) and BES (Body Esteem Scale; Franzoi & Shields, 1984) Physical Condition subscale. Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996) Body Surveillance subscale. MBSRQ Appearance Evaluation subscale measured, but not reported as an individual score.	Intervention group experienced marginally significant increase in body appreciation pre-post intervention, compared to control group. Improvement maintained at follow-up. Intervention group experienced significant increase in functionality satisfaction (measured by the BES Physical condition subscale) pre-post compared to the control group; however, both groups had increased functionality satisfaction at follow-up. There were no significant differences between groups, or across time, for body surveillance.	BAS: Post *d* = 0.68 Follow-up *d* = 0.63 BES (PC): Post *d* = 0.62 Follow-up *d* = 0.44	Strong
Alleva et al., (2018) UK	Female (*M*age = 22.79, *SD* = 3.75)	English-speaking adult women who wanted to improve body image	Online functionality-based, structured writing intervention (*Expand Your Horizon*)	261	Online, self-directed	RCT	1 week & 1 month	Active control group: online writing-based creativity training programme	Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015a) and BES (Body Esteem Scale; Franzoi & Shields, 1984) Physical Condition subscale	Intervention group experienced significant improvements in body appreciation and physical condition (used to measure satisfaction with functionality) from pre-post compared to control group. Improvements maintained at follow-ups.	BAS-2: Post *d* = 0.24 Follow-up 1 *d* = 0.20 Follow-up 2 *d* = 0.15 BES (PC): Post *d* = 0.26 Follow-up 1 *d* = 0.23 Follow-up 2 *d* = 0.22	Strong

Table 1. (Continued)

Sample Characteristics			Intervention			Study Characteristics			Outcome Measures	Results		Methodological quality
Author/ Year/ Location	**Gender/ age**	**Population**	**Type**	**Sample size**	**Delivery**	**Design**	**Follow-up**	**Comparison Group**	**Positive Body Image**	**Positive Body Image Outcomes**	**Effect Size (Cohen's *d*)**	**Global Rating**
Alleva et al. (2018) UK	Female (*M*age = 44.82 *SD* = 12.50)	British adult women with arthritis who wanted to improve body image	Online functionality-based, structured writing intervention (*Expand Your Horizon*)	84	Online, self-directed	RCT	1 week & 1 month	Wait-list control group	BAS-2 (Tylka & Wood-Barcalow, 2015a), Functionality Appreciation Scale (FAS; Alleva, Tylka, & Kroon Van Diest, 2017).	Intervention group experienced significant improvements in body appreciation and functionality appreciation pre-post compared to control group. Improvements maintained at follow-up.	BAS-2: Post *d* = 0.60 Follow-up 1 *d* = 0.47 Follow-up 2 *d* = 0.47 FAS: Post *d* = 0.81 Follow-up 1 *d* = 0.43 Follow-up 2 *d* = 0.42	Strong
Annesi, (2005) USA	Female (*M*age = 41.1, *SD* = 12)	New female members of a wellness centre in the USA	Cardiovascular exercise intervention	78	Independent, self-directed	Non-randomised controlled study	None	Inactive control group	BES (Franzoi & Shields, 1984) female-specific subscales (Weight Concern, Physical Condition, and Sexual Attractiveness)	Significant improvements in weight concern (WC) and physical condition (PC) from pre-post compared to the control group. No significant differences in sexual attractiveness across time or between groups.	BES (WC): Post *d* = 0.69 BES (PC): Post *d* = 0.49	Moderate
Bush et al. (2014) USA	Female (*M*age = 45, *SD* = 11.30)	Adult women employees/ spouses at a university	Workplace mindfulness-based intuitive eating intervention	124	Group-based, led by psychologists	Non-randomised controlled feasibility study	None	Wait-list control group	BAS (Avalos, Tylka, & Wood-Barcalow, 2005)	Significant improvement in body appreciation post-intervention in the intervention group compared to the control group.	BAS: *d* = 1.15	Moderate
Duarte, Pinto-Gouveia, & Stubbs (2017) Portugal	Female Int. *M*age = 37.73, *SD* = 7.50; Cont. = 35.78, *SD* = 9.08)	Adult women who met DSM criteria for binge eating disorder (BED)	Low-intensity, group psychoeducation and online compassion acceptance and mindfulness intervention.	20	Expert-led group session and self-directed	RCT	1 month	Wait-list control group	Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013) Portuguese version (Ferreira et al., 2011)	Intervention group had significantly improved body image flexibility following the intervention, compared to the control. Improvements maintained at follow-up.	BIAAQ: *Post d* = 0.73 (Not possible to calculate follow-up)	Weak

Table 1. (Continued)

Sample Characteristics			Intervention			Study Characteristics			Outcome Measures	Results		Methodological quality
Author/ Year/ Location	**Gender/ age**	**Population**	**Type**	**Sample size**	**Delivery**	**Design**	**Follow-up**	**Comparison Group**	**Positive Body Image**	**Positive Body Image Outcomes**	**Effect Size (Cohen's *d*)**	**Global rating**
Pinto et al., (2003) USA	Female (*M*age = 52.5 years, *SD* = 6.8)	Sedentary women diagnosed with breast cancer in past 3 years	Exercise	24	Supervised	Non-randomised controlled study	None	Wait-list control group	BES (Franzoi & Shields, 1984) female-specific subscales (Weight Concern, Physical Condition, & Sexual Attractiveness)	Significant improvements in weight concern (WC) and physical condition (PC) from pre-post compared to the control group. No significant differences in sexual attractiveness across time or between groups.	BES (WC): *Post d* = 1.2 BES (PC): *Post d* = 1.12	Weak
Pinto-Gouveia et al. (2017) Portugal	Female (Int. *M*age= 42.72, *SD* = 9.94; Cont. *M*age = 41, *SD* = 9.56)	Females adults diagnosed with BED	Psychoeducation, mindfulness and compassion-based (BEfree)	36	Group-based, led by clinical psychologists	Non-randomised controlled study	3 months & 6 months	Wait-list control group	BI-AAQ (Sandoz et al., 2013) Portuguese version (Ferreira, Pinto-Gouveia, & Duarte, 2011)	Significant decreases in body image inflexibility pre-post in for intervention group compared to the control. Maintained at follow-up.	BIAAQ: *Post d* = 0.51 (Not possible to calculate follow-up)	Weak
Toole & Craighead (2016) USA	Female (*M*age = 18.85, *SD* = 0.87)	Female undergraduate students with body dissatisfaction	Self-compassion and meditation podcasts	80	Self-directed (listen in lab and then at home)	Non-randomised controlled study	None	Wait-list control group	BAS (Avalos, Tylka, & Wood-Barcalow, 2005) and OBCS Body Surveillance subscale (McKinley & Hyde, 1996)	Significant increase in body appreciation and decrease in body surveillance for the intervention group pre-post compared to the control group.	BAS Post *d* = 0.22 OBCS Post *d* = 0.20	Moderate
Wolfe & Patterson (2017) USA	Female (*M*age = 20.44, *SD* = 6.93)	Female undergraduate students	Gratitude and cognitive restructuring interventions	108	Self-directed, workbook-based	Non-randomised controlled study	None	Active control group: educational body image workbook	BAS (Avalos, Tylka, & Wood-Barcalow, 2005) and BES Weight Concern (WC) subscale (Franzoi & Shields, 1984)	No significant difference found between groups or over time for body appreciation. Gratitude condition significantly increased body esteem from pre-post, compared to the control group. No significant differences in body esteem pre-post for cognitive restructuring condition.	BES (WC): Gratitude intervention: Post *d* = 0.24	Moderate
Jankowski et al. (2017) UK	Male (*M*age = 20.75, *SD* = 4.59)	British male students undertaking psychology dual major degrees	Cognitive dissonance-based	74	Group-based, peer-led	Pilot controlled trial	3 months	Assessment only control group	BAS (Avalos, Tylka, & Wood-Barcalow, 2005)	Per-protocol analysis: Intervention group had significant improvements in body appreciation pre-post compared to the control group. Improvements maintained at follow-up. Intention-to-treat analysis: No significant effect of intervention on body appreciation.	BAS: Per-protocol: Post *d* = 0.46 Follow-up *d* = 0.62	Weak

Table 1. (Continued)

Sample Characteristics			Intervention			Study Characteristics			Outcome Measures	Results		Methodological quality
Author/ Year/ Location	**Gender/ age**	**Population**	**Type**	**Sample size**	**Delivery**	**Design**	**Follow-up**	**Comparison Group**	**Positive Body Image**	**Positive Body Image Outcomes**	**Effect Size (Cohen's *d*)**	**Global rating**
Mellor et al (2017) Australia	Male (Int. *M*age = 51.40, *SD* = 7.52; cont. *M*age = 54.93, *SD* = 4.81)	Australian men in mid-life (40-65)	Psycho-education	76	Group-led by psychologist/ postdoctoral students aged 25-30	Cluster RCT	3 months	Wait-list control group	BAS (Avalos, Tylka & Wood-Barcalow, 2005)	Body appreciation did not significantly improve from baseline to post-intervention or follow up.	N/A	Weak
Rodgers et al (2018) USA	Male and female (Mage=18. 36, SD=1.34)	American emerging adults	Mobile phone app-based	274	Self-directed	RCT	12 weeks	Assessment only control group	Body esteem Scale for Adults and Adolescents (BESAA; Mendelson, Mendelson, & White, 2001) Appearance Esteem subscale and BI-AAQ (Sandoz et al, 2013)	Significant increase in body esteem from pre-post compared to control group. No significant differences in body image flexibility between groups or across time.	BESAA (AE): Post *d* = 0.32 Follow-up *d* = 0.25	Moderate

Table 2. Detailed information about content of interventions included in the review

Author	Approach	Delivery	Duration	Content
Ahmadi et al. (2017)	CBT-based intervention	Group programme	Eight sessions of 60 minutes over 2 months	Based on Cash's (1997) 8-step CBT-based body image programme.
Jankowski et al. (2017)	Cognitive dissonance-based intervention (Body Project M)	Peer-led, manualised group sessions.	Two 90-minute sessions over 2 weeks.	Discussion-based sessions in groups of 7-10 students, facilitated by 2-3 Peer Leaders. Session 1- Introduction and icebreaker, defining appearance ideal, its origins and the costs of perusing it. Identifying pressures to adhere to appearance ideal and who benefits from promoting it. Homework- 1. Mirror exercise 2. Letter to younger self or male relative about costs of pursuing appearance ideal 3. Behavioural challenge. Session 2- review of homework, role play about resisting pressures to pursue ideal, challenging negative body talk, resisting future pressures.
Mellor et al. (2017)	Psychoeducation (Better with Age Programme)	Manualised group-based	One 90-minute session per week for four consecutive weeks	Manual including discussions, case studies, worksheets, and homework about changes in physical functioning during midlife, health, diet and exercise guidelines, stress management, positive body image, self-coping strategies.
Bush et al. (2014)	Mindfulness-based intuitive eating intervention (Eat for Life)	Manualised group-based (25 individuals per group), took place at workplace	10 sessions over consecutive 10 weeks	Formal mindfulness practice, group discussion about homework and psychoeducational lecture about intuitive eating. Participants also undertook weekly homework tasks from intervention manual, readings and mindfulness and intuitive eating practice using a CD.
Annesi (2005)	Cardiovascular exercise intervention	Self-directed	Three 20-30-minute sessions per week for 12 weeks.	Self-directed exercise took place a Wellness Centre. Participants instructed to keep a log of the duration of exercise sessions and apparatus used.
Pinto, Clark, Maruyama, & Feder (2003)	Exercise intervention	Supervised Individual sessions	Three 40-minute session per week for 12 weeks	Taught basic exercise techniques and carried out personalised exercise programme including three modes of physical activity per session and strength training during the last month of the intervention. Encouraged to continue exercising at home during the intervention.
Alleva et al. (2015) Alleva et al. (2018a) Alleva et al. (2018b)	Functionality-based writing intervention (*Expand Your Horizon* Programme)	Online self-directed	Three sessions over 1 week. 15-minute writing assignments every 2 days.	Instructed to describe body's functions and why they are important and meaningful to them. Task 1-Body's senses & physical capabilities Task 2- Health and creative endeavours Task 3- Self-care and communication with others

Table 2. (Continued)

Author	Approach	Delivery	Duration	Content
Duarte, Pinto-Gouveia, & Stubbs (2017)	Mindfulness and compassion-based intervention relating to binge eating (CARE Programme)	Group psychoeducation and self-directed online website (including audio exercises)	One 2.5-hour psychoeducation session followed by 4 weeks of self-directed exercises. Instructed to practice once a day.	Researcher-led psychoeducation session about managing binge eating, based on mindfulness and compassion. Mindfulness exercises (Week 1 and 4) based on BE free programme (Pinto-Gouveia et al., 2016): mindful breath, body scan, and mindful eating. Compassionate imagery exercises (weeks 2-4) adapted from Gilbert and Cohen's (2013) overeating self-help manual: building compassionate self, cultivating compassion relating to others, eating difficulties and the self.
Pinto-Gouveia et al. (2017)	Psychoeducation, mindfulness and compassion-based intervention for binge eating (Befree Programme)	Group sessions led by Clinical Psychologists	12 2.5-hour sessions.	Group sessions covering creative hopelessness, psychoeducation (binge eating), values clarification, experiential distancing, acceptance and willingness, mindfulness, compassion, and committed action.
Rodgers et al. (2018)	Psychoeducation and self-compassion-based intervention (BodiMojo)	Self-directed mobile app intervention	Daily app use for 6 weeks.	Three components of the app: mood tracking and emotion regulation, gratitude journaling. Twice daily intervention messages (affirmations, behavioural tips or psychoeducational message) about three aspects of self-compassion (mindfulness, self-kindness, common humanity, (K. Neff, 2003), body image content (media literacy, peer influences and appearance comparisons), and healthy lifestyle (mindful eating, sleep hygiene, physical activity). Links to quizzes or meditation audio clips.
Albertson et al. (2015) Toole and Craighead (2016)	Self-compassion meditation intervention	Self-directed, podcasts	Three 20-minute podcasts, daily meditation. Albertson: Participants given one podcast per week for 3 weeks. Toole and Craighead: Participants given three podcasts over 1 week.	Guided self-compassion meditations from Neff and Germer's (2013) Mindful Self-Compassion Programme. Week 1- Compassionate body scan Week 2- Affectionate breathing Week 3- Loving kindness Toole and Craighead asked participants to listen to the first podcast in a laboratory.
Wolfe and Patterson (2017)	(a) Cognitive Restructuring intervention (b) Gratitude-based intervention	Self-directed, workbooks	One session per day for 14 days.	Workbooks with intervention information and 14 worksheets. Gratitude intervention: Create a gratitude list every day for 14 days. Cognitive restructuring intervention: Create automatic thought records relating to negative thoughts about the body.

Table 3. Methodological quality assessment of studies included in the review, using the Effective Public Health Practice Project (EPHPP)

Authors/year	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Global Quality Rating
Alleva et al. (2015)	1	1	1	2	1	1	Strong
Alleva et al. (2018a)	2	1	1	2	1	1	Strong
Alleva et al. (2018b)	2	1	1	1	1	1	Strong
Ahmadi et al. (2017)	2	1	1	3	1	1	Moderate
Annesi (2005)	1	1	1	3	1	1	Moderate
Bush et al. (2014)	2	1	1	3	1	2	Moderate
Toole and Craighead (2016)	1	1	1	3	1	1	Moderate
Wolfe and Patterson (2017)	2	1	1	3	1	1	Moderate
Rodgers et al. (2018)	2	1	1	3	1	1	Moderate
Albertson et al. (2015)	1	1	1	3	1	3	Weak
Duarte, Pinto-Gouveia, and Stubbs (2017)	3	1	1	3	1	2	Weak
Pinto, Clark, Maruyama, and Feder (2003)	2	1	3	3	1	3	Weak
Pinto-Gouveia et al. (2017)	3	1	1	3	1	3	Weak
Jankowski et al. (2017)	1	1	1	3	1	3	Weak
Mellor et al. (2017)	3	1	3	3	1	2	Weak

Quality Ratings: 1 = Strong, 2 = Moderate, 3 = Weak

Table 4. Outcome measures used to assess components of positive body image

Outcome Measure	Authors	Description	Subscales	Psychometric evidence	Studies in the review using the measure
Body Appreciation Scale (BAS)	Avalos, Tylka, & Wood-Barcalow (2005)	Measures appreciation, acceptance, respect and favourable feelings towards one's body	13 items scored on a 5-point Likert-type scale	Evidence of unidimensionality, construct validity, internal validity, and 3-week test-retest reliability (Avalos et al., 2005)	Albertson et al. (2015), Alleva et al. (2015), Bush et al. (2014), Toole and Craighead (2016), Wolfe and Patterson (2017), Jankowski et al. (2017), Mellor et al. (2017).
Body Appreciation Scale-2 (BAS-2)	Tylka and Wood-Barcalow (2015)	Measures appreciation of one's body	10 items scored on 5-point Likert-type scale	Evidence of unidimensionality, invariance across sex, construct validity, internal consistency, and test-retest reliability at 20 weeks (Tylka & Wood-Barcalow, 2015a)	Alleva et al. (2018a, 2018b)
Body Esteem Scale (BES)	Franzoi and Shields (1984)	Measures how an individual evaluates their own body and appearance/ how satisfied they are with their appearance	35 items scored on a 5-point Likert-type scale. Three subscales: Physical Attractiveness (male only) or Sexual Attractiveness (female only), Upper Body Strength (male only) or Weight Concern (female only) and Physical Condition (male and female).	Evidence of reliability, validity, and 3-moth test-retest reliability (Franzoi, 1994; Robinson, Shaver, & Wrightsman, 1991)	Alleva et al (2015, 2018), Annesi (2005), Pinto et al. (2003), Wolfe and Patterson (2017).
Body Esteem Scale for Adolescents and Adults (BESAA)	Mendelson, Mendelson, and White (2001)	Measures how an individual evaluates their own body and appearance/ how satisfied they are with their appearance	30 items scored on a 5-point Likert-type scale. Three subscales: Appearance, Attribution and Weight.	Evidence of internal consistency and test-retest reliability (Mendelson et al., 2001)	Rodgers et al. (2018)
Body Image Acceptance and Action Questionnaire (BI-AAQ)	Sandoz et al. (2013) Portuguese version - Ferreira, Pinto-Gouveia, and Duarte (2011), Ferreira et al. (2011)	Measures body image flexibility	12 items scored on a 7-point Likert-type scale	Evidence of construct validity, internal consistency, and 3-month test-retest reliability (Sandoz et al., 2013)	Duarte, Pinto-Gouveia, and Stubbs (2017), Pinto-Gouveia et al.(2017), Rodgers et al. (2018)
Functionality Appreciation Scale (FAS)	Alleva, Tylka & Kroon Van Diest (2017)	Measures the extent to which an individual appreciates their body for its functions	7 items scored on a 5-point Likert-type scale	Evidence of unidimensionality across gender, internal consistency, construct validity, and 3- week test-retest reliability (Alleva et al., 2017)	Alleva et al. (2018)
Multidimensional Body Self-Relations Questionnaire (MBSRQ)- Appearance Evaluation (AE) subscale	Brown, Cash, and Mikulka (1990); Cash (2000)	AE subscale measures an individual's satisfaction with their appearance	7-item subscale scored on a 5-point Likert-type scale.	Evidence of internal consistency and 1-month test-retest reliability (Cash, 2000)	Ahmadi et al. (2017)
Objectified Body Consciousness Scale (OBCS) Body Surveillance (BS) subscale	McKinley and Hyde (1996)	BS subscale measures extent to which someone thinks about how their body looks to others. Has been used to measure body functionality (low body surveillance = high body functionality)	8 -item subscale scored on an 8-point Likert-type scale	Evidence of internal consistency reliability and convergent validity (McKinley & Hyde, 1996)	Alleva et al. (2015), Toole and Craighead (2016)