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A systematic review of interventions aiming to promote positive body image in children and adolescents

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ABSTRACT

Evidence shows interventions can improve positive body image in adult women. This systematic review examined the evidence of efficacy of interventions that aimed to increase positive body image in children and young people aged under 18 years. The authors followed PRISMA guidelines for the review. Searches of CINAHL Plus, Medline, PsychINFO, Wiley Online Library, SCOPUS and grey literature were conducted up to February 2021 and identified 4171 papers. Thirteen studies evaluating 12 interventions, designed for children/adolescents aged 9–18 years, were eligible and evaluated using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool. The studies evaluated body appreciation, body-esteem, and embodiment. Studies using cognitive dissonance, peer support, and psychoeducation had evidence of improving body appreciation and body-esteem in adolescent girls. However, evidence of efficacy for younger children and boys was lacking and the studies ranged in methodological quality. Further research should rigorously evaluate positive body image interventions using second-generation measures that assess specific components of positive body image and consider how to promote positive body image in young children and boys.

1. Introduction

Body image is now recognised as a public health issue, relevant to girls and boys as young as six years old, which should be addressed at school (Bornioli, Lewis-Smith, Smith, Slater, & Bray, 2019; Cash & Smolak, 2011; De Jesus et al., 2015; Government Equalities Office, 2015; Schuck, Munsch, & Schneider, 2018; Tatangelo & Ricciardelli, 2017; Yager, Diedrichs, Ricciardelli, & Halliwell, 2013). Numerous, often school-based, interventions have evidence of efficacy at reducing body dissatisfaction and related factors in children and young people (Kusina & Exline, 2019; Yager et al., 2013). However, in addition to decreasing pre-existing body image concerns and related negative outcomes, researchers are now increasingly considering body image holistically by investigating effective ways to promote positive body image, a multifaceted construct that is associated with various aspects of psychological and physical health and wellbeing (Halliwell, 2015). Consequently, promoting positive body image, rather than looking to alleviate body dissatisfaction after it has developed, is important to improve overall wellbeing (Webb, Wood-Barcalow, & Tylka, 2015).

Positive body image is shown to be an independent construct from negative body image, the former being characterised by multifaceted features including an appreciation of the body and its functional abilities, an awareness of the body's needs, and an ability to protect oneself against harmful appearance-related cultural messaging (Menzel & Levine, 2011; Webb, Butler-Ajibade, & Robinson, 2014; Webb et al., 2015). Most research to date has been carried out with adult women and finds that positive body image is related to various aspects of physical and psychosocial health and wellbeing. For instance, body appreciation is related to health behaviours including adaptive eating, protecting the skin from sun damage, and attending medical screenings (Andrew, Tiggemann, & Clark, 2016a). Moreover, positive body image relates to self-esteem, life satisfaction, and self-compassion, and is thought to protect individuals from appearance-related messages and pressures to conform to sociocultural appearance ideals (Andrew et al., 2016a; Halliwell, 2013, 2015; Tylka & Wood-Barcalow, 2015b).

In relation to children and young people, research also finds positive body image to be associated with various positive health and

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wellbeing-related outcomes. For example, in a longitudinal study with 298 girls aged 12–16 years old, Andrew et al. (2016b) found that body appreciation predicted decreased levels of dieting, alcohol consumption, smoking, and carrying out intuitive eating. In addition, Halliwell, Jarman, Tylka, and Slater (2017) identified that body appreciation is related to higher levels of body-esteem and positive affect, and lower levels of dieting, internalisation of appearance ideals, and body surveillance in both girls and boys aged 9–11 years. Therefore, examining how to promote positive body image in children and young people is an important focus of research in the field.

Promisingly, research has found that positive body image can be fostered through interventions (Tylka & Wood-Barcalow, 2015b). In line with this, a systematic review by Guest et al. (2019), which followed a similar protocol to the current review, identified 15 studies, evaluating 13 interventions that aimed to promote one or more aspects of positive body image in adults. The authors concluded that there was evidence that several different interventions of strong and moderate methodological quality can improve one or more components of positive body image in adult women. This included an online functionality-based writing intervention, self-directed exercise and self-compassion interventions, and group cognitive behavioural therapy and mindfulness-based intuitive eating programmes (see Guest et al. (2019)). However, there was minimal evidence of such an effect in men. The finding that positive body image can be fostered in adult women suggests it may also be promoted in children and adolescents through existing interventions. Moreover, promoting positive body image at this early stage — potentially before children and adolescents have been heavily exposed to appearance ideals and have developed negative schemas relating to their own appearance — could help individuals grow up with a healthier body image and enable them to interpret appearance-related messages in a protective and adaptive way (Tylka & Wood-Barcalow, 2015b).

Within adult populations, outcome measures have been developed and validated to assess various facets of positive body image, including body appreciation (Body Appreciation Scale; Avalos, Tylka, & Wood-Barcalow, 2005; Body Appreciation Scale-2; Tylka & Wood-Barcalow, 2015a), functionality appreciation (Functionality Appreciation Scale; Alleva, Tylka, & Van Diest, 2017), body image flexibility (Body Image Acceptance and Action Questionnaire; Sandoz, Wilson, Merwin, & Kellum, 2013), and broader positive embodiment (Experience of Embodiment Scale; Piran, Teall, & Counsell, 2020). However, the development of measures of positive body image is less advanced for children and adolescents. To date, the Body Appreciation Scale-2 for Children (BAS-2 C; Halliwell et al., 2017) is the only measure of positive body image that has been validated with samples of young children (9–11 years). Prior to this, the Body Appreciation Scale (BAS; Avalos et al., 2005), which has only been validated with adults, and Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015a), which has been validated with adolescent girls and boys aged 12–19 and adolescent girls aged 14–15 years (Halliwell, Jarman, McNamara, Risdon, & Jankowski, 2015; Lemoine et al., 2018) have been relied on within research.

Further to this, before specific second-generation positive body image-related outcome measures were developed, researchers relied on satisfaction-based measures including the Body-Esteem Scale (Franzoi & Shields, 1984), the Body-Esteem Scale for Adolescents and Adults (Mendelson, Mendelson, & White, 2001), the Appearance Evaluation Subscale of the Multidimensional Body Self-Relations Questionnaire (MBSRQ; Brown, Cash, & Mikulka, 1990; Cash, 2000), and the Functional Satisfaction subscale of the Embodied Image Scale (Abbott & Barber, 2010). These first-generation measures assess positive body image by examining an individual's overall positive evaluation of / feelings towards their body by exploring their satisfaction with different body parts (Avalos et al., 2005; Halliwell et al., 2017). However, a limitation of using these measures to assess positive body image is that they measure body satisfaction *and* dissatisfaction on a continuum, rather than treating positive body image as a separate and independent construct. While body-esteem does correlate with body appreciation, first-generation measures do not adequately measure the complexity of positive body image, which is a multifaceted construct (Avalos et al., 2005). Nonetheless, these measures provided a proxy for measuring positive body image before more specific measures were available.

The development of specific measures for children and young people has occurred relatively recently and therefore numerous interventions that have specifically aimed to improve positive body image in this population have been evaluated by first-generation measures. For example, body-esteem has often been used to measure positive body image/body appreciation using the Body-Esteem Scale (BES), Body-Esteem Scale for Children (BES-C), and Body-Esteem Scale for Adults and Adolescents (BESAA), which have been validated with adults, children, and young people aged 10–18 years (Franzoi & Shields, 1984; Menzel & Levine, 2011). Table 3 provides further information on outcome measures used to assess positive body image in children and young people. To capture the full range of interventions that aim to increase positive body image in children and young people, studies using first-generation measures have been included in the review.

In summary, various interventions for adults have been found effective at increasing components of positive body image; however, the evidence of efficacy of interventions for children and adolescents has not been assessed more broadly using a systematic review. To address this, the aim of the current systematic review is to determine the evidence of efficacy of interventions aiming to promote positive body image in children and young people aged 18 years and below.

2. Method

This systematic review was carried out in line with the Cochrane Handbook for Systematic Reviews (Green & Higgins, 2011) with guidance from the PRISMA statement for reporting systematic reviews (Moher, Liberati, Tetzlaff, & Altman, 2009). This systematic review follows an adapted version of Guest et al. (2019) systematic review of interventions aiming to promote positive body image in adults, which can be made available on request (PROSPERO registration: CRD42018100703).

2.1. Search strategy

Database searches were conducted using CINAHL Plus, Medline, PsychINFO, Wiley Online Library and SCOPUS up to 10 February 2021 using the search string "Positive body image" OR "body image" OR "body satisfaction" OR "body appreciation" OR "body functionality" OR "body-esteem" AND "intervention" OR "program*". Additional searches were conducted using grey literature, the reference lists of included papers and relevant journals (e.g., *Body Image*). Unpublished studies were not included. The data screening process is presented as a PRISMA flow-chart in Fig. 1.

2.2. Eligibility criteria

To be eligible for the review, studies had to be published in peer-reviewed journals, written in English (due to insufficient resources to translate all potential non-English articles), and report quantitative data. The PICO criteria (Richardson, Wilson, & Hayward, 1995) was applied as follows:

2.3. Population

Studies with child or adolescent populations (mean age ≤18) were included. Fifteen studies with adult samples (mean age ≥18) are reported separately in Guest et al. (2019).

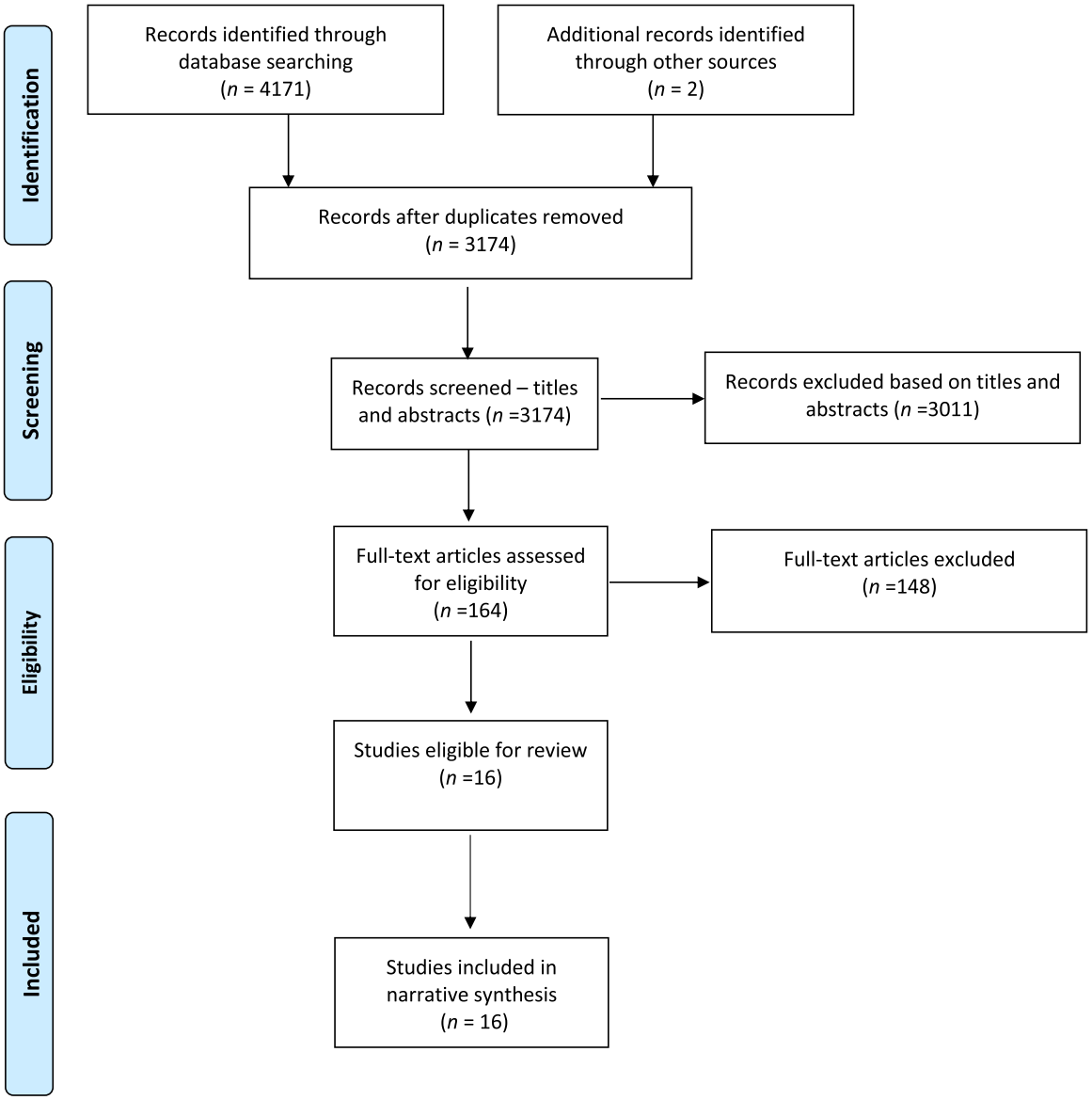

Fig. 1. PRISMA flow-diagram of screening process review.

2.4. Intervention

Studies were required to include an intervention using a physical, educational, or psychosocial approach and where the journal articles stated that the intervention aimed to improve/promote positive body image or a related construct and/or the intervention material directly related to improving aspects of positive body image (e.g., body appreciation, bodily self-care). This was independently assessed and agreed by authors EG and FZ. Information about the aims of each study included in the review can be found in Table 1.

2.5. Comparison

It was a requirement for studies to include a comparison group due to increased risk of bias from single-group studies, but the studies were not required to be randomised (Kendall, 2003).

2.6. Outcomes

Studies had to include one or more validated first- or second-generation positive body image outcome measures at pre- and post-intervention. Webb *et al.* (2015) article about the measurement of positive body image was used to determine validated outcome measures that assess facets of positive body image. Given the lack of positive body image measures validated with children, any validated measure of positive body image was included, including those that had only been validated with adults.

2.7. Data extraction

Authors EG, FZ, BC, RB and DH independently carried out data extraction as recommended by the Cochrane Handbook for Systematic Reviews of Interventions (Green & Higgins, 2011). Information about study design, participant characteristics, intervention, outcome measures and results were extracted and are presented in Table 1.

2.8. Methodological quality assessment

Four reviewers (EG, BC, FZ & RB) determined the methodological quality of the included studies using the Effective Public Health Practice Project's Quality Assessment Tool for Quantitative Studies,

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	Global Rating
Amaral et al. (2019) Brazil	Female (M age = 16.25, SD= 1.4)	Female adolescent high school students with body image concerns	Cognitive dissonance-based intervention aiming to improve body appreciation.	141	Group-based, led by trained researchers	RCT	None	Inactive control	Body Appreciation Scale - Portuguese version (Caetano, 2011)	Intervention group experienced significant improvements in body appreciation from pre-to-post assessment compared to control group.	0.91	3
Buchholz et al. (2008) Canada	Female (M age= 13.4, SD= 1.45)	Young female athletes (aged 11–18)	Psycho-education: Body Sense, a preventative positive body image initiative for female athletes.	106	Expert-led group workshops	Cluster RCT	None	Wait-list control	Body-Esteem Scale for Adolescents and Adults (Mendelson et al., 2001)	No significant changes in body esteem nor its subscales (appearance, weight and attribution) in either condition and no difference between conditions.	Appearance = 0.25 Weight = 0.07 Attribution = 0.08	3
Cox et al. (2018) USA	Male and female (Int. M age = 16.45, SD = 1.0. Control: M age = 14.52, SD = 0.51)	High school students (aged 14–18)	Yoga physical education focused on increasing mindful movement, body appreciation and self-compassion	44	Group classes led by yoga instructor	Pilot controlled trial	None	Active control: Traditional physical education	Body Appreciation Scale (Avalos et al., 2005)	No significant difference in body appreciation changes between conditions.	0.27	2
Diedrichs et al. (2016) UK	Female (Int. 1. M age = 13.03, SD = 0.89. Int. 2. M age = 12.98, SD = 0.82. Control M age = 12.99, SD = 0.86	Female adolescents aged 11–14 for whom body image concerns were relevant (as identified by mothers)	Online information hub for mothers consisting aiming to improve positive body image and psychosocial wellbeing among adolescent girls and their mothers Intervention 1 = tailored material; Int. 2 = unstructured	235	Website, expert-initiated personalised pathway in Int. 1; self-directed in Int. 2.	Cluster RCT	6 weeks & 12 months	Self-directed intervention group & Inactive control	The Appearance Esteem and Weight Esteem subscales of the Body Esteem Scale for Adults and Adolescents (Mendelson et al., 2001).	No significant changes to daughters' appearance or weight esteem between conditions.	Not possible from published data.	1
Franko et al. (2013) USA	Male and female (Male M age = 15.4, SD = 1.04. Female M age = 15.2, SD = 0.78)	Public high school students (aged 14–18)	Online holistic health education intervention designed to promote positive body image in adolescents.	178	Online, self-directed	RCT	3 months	Active control: Standard health education classes	Body-Esteem Scale for Adolescents and Adults (Mendelson et al., 2001)	For girls only, intervention group experienced significant improvements in the appearance subscale of body esteem from pre-to-post assessment	Appearance (all pts) Post = 0.03; 3-month Follow-up = 0.01 Appearance (girls) Post = 0.2; 3-month Follow-	2

(*continued on next page*)

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	Global Rating
										compared to control group. The improvements were lost at 3-month follow-up. No differences were found on weight nor attribution subscales.	up = 0.07 Weight (all pts) Post = −0.1; 3-month Follow-up = 0.05 Weight (girls) Post = 0.04; 3-month Follow-up = 0.13 Attribution (all pts) Post = −0.22; 3-month Follow-up = 0.11 Attribution (girls) Post = −0.34; 3-month Follow-up = −0.31	
Guest et al. (2021) UK	Male and female (M age = 10.26, SD = 0.67)	School children (aged 9–11)	Board game intervention aiming to increase body appreciation in children.	240	Classroom-based, facilitated by researcher	Cluster RCT	2 weeks	Active control	Body Appreciation Scale 2-Children (Halliwell et al., 2017)	No significant improvements in body image in the intervention group compared to the control group.	Post = 0.18 2-week Follow-up = 0.03	1
Halliwell et al. (2015) UK	Female (M age = 14.84, SD = 0.37)	Female high school students (aged 14–15)	Cognitive dissonance-based intervention aiming to improve body appreciation in adolescent girls.	62	Classroom-based, facilitated by trained undergraduate psychology students	RCT	None	Wait-list control	The Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015)	Intervention group reported significant improvements in body appreciation from pre-to-post assessment compared to control group.	Post = 0.26	1
Halliwell et al. (2018) UK	Male and female (M age = 9.34, SD = 0.69)	School children (aged 9–11)	Yoga intervention aiming to improve positive body image in children.	344	School class-based led by qualified yoga instructor	Cluster RCT	6 weeks	Active control – PE lessons as usual	The Appearance Esteem subscale of the Body Esteem Scale for Children (Mendelson & White, 1993) & The Body Appreciation Scale-2 for Children (Halliwell *et al.* 2017)	Both intervention and control groups reported increased body appreciation and body esteem from pre to post assessment, maintained at follow-up. No significant differences between groups.	Appearance Esteem Post = −0.21; 6-week Follow-up = 0.12 Body Appreciation Post = −0.01; 6-week Follow-up = 0.08	1
			Girl Talk peer support programme,	214	School class-based facilitated	Controlled trial	3 months	Inactive control	Body-Esteem Scale for	Body Esteem Appearance and	Appearance Post = 0.13; 3-	2

(*continued on next page*)

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	Global Rating
McVey et al. (2003a) Canada	Female (M age = 12.5, SD = 0.54)	Female school children (aged 12–14)	which aims to promote positive body image.		by trained public health nurses				Adolescents and Adults (Mendelson et al., 2001)	Weight subscales significantly improved from baseline to post-assessment, and from post to follow-up in intervention group, but not in control group. No effect found for the Attribution subscale.	month Follow-up = 0.26 Weight Post = 0.28; 3-month Follow-up = 0.42 Attribution Post = −0.2; 3-month Follow-up = −0.05	
McVey et al. (2003b) Canada	Female (M age = 12.3, SD = 0.63)	Female school children (aged 12–14)	Girl Talk peer support programme, which aims to promote positive body image.	282	School class-based facilitated by trained public health nurses	Controlled trial	3 months	Inactive control	Body-Esteem Scale for Adolescents and Adults (Mendelson et al., 2001)	Both intervention and control groups reported increased body esteem in each subscale from pre to post assessment, maintained at follow-up. No significant differences between groups.	Appearance Post = 0.13; 3-month Follow-up = 0.26 Weight Post = 0.28; 3-month Follow-up = 0.42 Attribution Post = −0.2; 3-month Follow-up = −0.05	2
Regehr et al. (2020) Canada	Male and female (M age = 12.28, SD= 0.51)	Seventh grade students	Free to Be media literacy and cognitive dissonance-based intervention aiming to promote positive body image in adolescents.	119	School-based led by a trained program facilitator	Quasi-experimental cohort	None	Inactive control	The Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015)	There was no significant difference in positive body image between comparison and intervention group.	-0.01	2
Sundgot-Borgen et al. (2019) Norway	Male and female (M age = 16.8, SD = 0.76)	High school students (aged 16–17)	Health Body Image Intervention: Interactive educational intervention aiming to promote positive embodiment and health-related quality of life.	2446	School class-based facilitated by two researchers	Cluster RCT	3 & 12 months	Inactive control	Experience of Embodiment Scale (Teall & Piran, 2012)	Boys showed significantly higher increase in positive embodiment from baseline to post-assessment in intervention vs control group, but effect lost from 3-month follow-up. Girls showed the equivalent results, but also maintained up 12-month follow-up.	Post = 0.01 3-month follow-up = 0.03 12-month follow-up = 0.01	3
Yager et al. (2019) Australia	Male (Int. M age = 15.96, SD =	Male high school	Education sessions on drug / supplement	237	Class-based facilitated by usual physical	Controlled trial	3 months	Wait-list control	Body-Esteem Scale for Adolescents and	No significant changes or differences	BES Appearance Post = 0.09; 3-	2

(*continued on next page*)

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	Global Rating
	0.40; Control M age = 15.74, SD = 0.38)	students (aged 15 –16)	use, strength training, sports nutrition, and bodily self-care.		education teacher and trained students				Adults (Mendelson et al., 2001). Functionality Satisfaction subscale of Embodied Image Scale (Abbott & Barber, 2010).	between intervention and control groups for Body-Esteem Scale. Functionality satisfaction increased in the intervention group compared to the control group at post- and 3-month follow-up. However, after adjusting for multiple comparisons, this was not significant.	month Follow-up = 0.16 BES Weight Post = −0.22; 3-month Follow-up = −0.03 Functionality Satisfaction Post = −0.127 3-month follow-up = 0.484	

known as the EPHPP (Thomas, Ciliska, Dobbins, & Micucci, 2004). The reviewers independently assessed the methodological quality of each article using the EPHPP. Ratings were then shared with the other reviewers. Any discrepancies were discussed and a final decision on rating was made. Where specific information needed to assess methodological quality was missing from a paper, FZ attempted to contact the authors to request it.

The EPHPP evaluates the methodological quality of studies assessing the evidence of efficacy/effectiveness of interventions based on their study design, data collection methods, the use of blinding, selection bias, confounding variables, and withdrawal and drop-out rates. Ratings for these five aspects of quality are combined to determine an overall quality rating of strong (no weak ratings), moderate (one weak rating), or weak (more than one week rating). The EPHPP was chosen for the review because it can be used to assess RCTs, non-randomised controlled trials (NRCTs), and pre-post case control studies, which are often employed within psychological research (Deeks et al., 2003; Jackson & Waters, 2005). Moreover, the EPHPP has been found to have sufficient content and construct validity (Jackson & Waters, 2005).

2.9. Appraisal of intervention efficacy

An intervention was considered effective if positive body image statistically significantly increased from pre-post in the intervention group compared to the control group. Methodological quality of the studies was also taken into consideration. Where sufficient data were available, Cohen's *d* effect sizes were calculated using the method recommended by Morris (2008) for RCTs or controlled trials, based on mean pre-post changes between intervention and control groups (effect sizes presented in Table 1). Cohen's *d* establishes effect sizes as small (*d*= 0.2), medium (*d*= 0.5) and large (*d*=0.8; Cohen, 1992).

2.10. Synthesis of results

The resulting studies were heterogeneous in methodology, with samples of children with a range of ages, employing different intervention approaches, and varying between single and mixed gender groups of participants. Additionally, three components of positive body image were assessed using seven different outcome measures: body appreciation, positive embodiment, and body-esteem (used as a proxy). For this reason, a meta-analytic approach was not appropriate, and a narrative synthesis was conducted (Mays, Pope, & Popay, 2005). The narrative synthesis includes study and intervention characteristics, efficacy of the interventions and methodological quality of the studies.

3. Results

3.1. Study characteristics

Thirteen studies, evaluating 12 interventions, were identified as eligible for the review. The studies were published between 2003 and 2020, with eight published in the past five years. The studies were carried out in a range of countries including one from Brazil (Amaral, Stice, & Ferreira, 2019), four from Canada (Buchholz, Mack, McVey, Feder, & Barrowman, 2008; McVey, Lieberman, Voorberg, Wardrope, & Blackmore, 2003; Regehr, Owens, Cox, & Clayton, 2020), two from the US (Cox, Ullrich-French, Howe, & Cole, 2017; Franko, Cousineau, Rodgers, & Roehrig, 2013), four from the UK (Diedrichs et al., 2016; Guest et al., 2021; Halliwell et al., 2015; Halliwell, Jarman, Tylka, & Slater, 2018), one from Norway (Sundgot-Borgen et al., 2019), and one from Australia (Yager, McLean, & Li, 2019).

3.2. Sample characteristics

Ages of participants ranged from 9 to 18 years old. Six studies had mixed-gender samples (Cox et al., 2017; Franko et al., 2013; Guest et al., 2021; Halliwell et al., 2018; Regehr et al., 2020; Sundgot-Borgen et al., 2019), six were conducted with female-only samples (Amaral et al., 2019; Buchholz et al., 2008; Diedrichs et al., 2016; Halliwell et al., 2018; McVey et al. 2003; McVey et al., 2003), and one had a male-only sample (Yager et al., 2019). Most studies recruited students from schools (Amaral et al., 2019; Cox et al., 2017; Franko et al., 2013; Guest et al., 2021; Halliwell, 2015; Halliwell et al., 2018; McVey et al., 2003; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Regehr et al., 2020; Sundgot-Borgen et al., 2019); however, one also recruited parents (Diedrichs et al., 2016) and one involved athletes (Buchholz et al., 2008). Additionally, Amaral et al. (2019) and Diedrichs et al. (2016) recruited samples of children who identified body image concerns as particularly relevant to them.

3.3. Intervention characteristics

The 13 studies evaluated 12 different interventions that aimed to improve/promote positive body image or a related construct. McVey et al. (2003a) and McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al. (2003) used the same manualised, class-based, peer support intervention, 'Girl Talk', and Halliwell et al. (2015) and Amaral et al. (2019) used different adapted versions of the cognitive dissonance intervention 'The Body Project'. Intervention approaches included yoga (Cox et al., 2017; Halliwell et al., 2018), cognitive dissonance (Amaral et al., 2019; Halliwell et al., 2015; Regehr et al., 2020), and, most commonly, psychoeducation (Buchholz et al., 2008; Diedrichs et al., 2016; Franko et al., 2013; Guest et al., 2021; McVey et al., 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Sundgot-Borgen et al., 2019; Yager et al., 2019).

Three interventions were self-directed (Diedrichs et al., 2016; Franko et al., 2013; Guest et al. (2021)); however, most were directed either by trained university students (Halliwell et al., 2015; Yager et al., 2019), physical activity instructors (Cox et al., 2017; Halliwell et al., 2018; Yager et al., 2019), health professionals (McVey et al., 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003), researchers (Amaral et al., 2019; Diedrichs et al., 2016; Sundgot-Borgen et al., 2019), or other trained professionals (Regehr et al., 2020).

Intervention intensity varied from single (Buchholz et al., 2008; Diedrichs et al., 2016; Guest et al., 2021; Halliwell et al., 2015) to multiple sessions (Amaral et al., 2019; Cox et al., 2017; Franko et al., 2013; Halliwell et al., 2018; McVey et al. 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Sundgot-Borgen et al., 2019; Yager et al., 2019). The length of the sessions ranged from 30 min to 90 min. Detailed information about the interventions is presented in Table 2.

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. Body-esteem, used as a first-generation satisfaction based measure of positive body image, was assessed using the Body-Esteem Scale for Adolescents and Adults (BES-AA; Mendelson et al., 2001) and the BES for Children (BES-C; Mendelson & White, 1982). It was the most common outcome assessed, used in seven studies. Five studies (Buchholz et al., 2008; Franko et al., 2013; McVey et al., 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Yager et al., 2019) used the BES-AA, and Diedrichs et al. (2016) the Appearance Esteem and Weight Esteem subscales of the BES-AA (Mendelson et al., 2001). One study used the BES-C (Halliwell et al., 2018; Mendelson & White, 1982), though Halliwell et al. (2018) only used the Appearance Esteem subscale. Body appreciation was assessed using the Body Appreciation Scale (BAS; Avalos et al., 2005), the BAS-2 (Tylka & Wood-Barcalow, 2015a) and BAS-2 for children (BAS-2-C; Halliwell et al., 2017) in six studies. Two studies (Amaral et al., 2019; Cox et al., 2017) employed the BAS, with Amaral et al. (2019) using the Portuguese version of the measure (Caetano, 2011). Two studies (Halliwell et al., 2015; Regehr et al., 2020) used the BAS-2, which was developed for adults, and two studies (Guest et al., 2021; Halliwell et al., 2018) used the BAS-2-C. One study measured functionality satisfaction using the Functionality Satisfaction subscale of the Embodied Image Scale (Abbott & Barber, 2010; Yager et al., 2019). Embodiment was measured in one study (Sundgot-Borgen et al., 2019) using the Experiences of Embodiment Scale (EES; Piran et al., 2020). See Table 3 for detailed information about the outcome measures.

3.5. Methodological quality of studies

The EPHPP assessment (Thomas et al., 2004) identified mixed methodological quality. Four studies were rated as strong (Diedrichs et al., 2016; Guest et al., 2021; Halliwell et al., 2015, 2018), six were rated as moderate (Cox et al., 2017; Franko et al., 2013; McVey *et al.* 2003; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Regehr et al., 2020; Yager et al., 2019), and three were rated as weak (Amaral et al., 2019; Buchholz et al., 2008; Sundgot-Borgen et al., 2019). The most common methodological issues were blinding (with five studies receiving a moderate rating and seven studies receiving a weak rating), selection bias (with nine studies receiving a moderate rating and one receiving a weak rating), withdrawals/dropouts (with three studies receiving a moderate rating and three studies receiving a weak rating), and confounders (with three studies receiving a weak rating).

One out of four strong quality studies (Halliwell et al., 2015), which used a cognitive dissonance-based intervention with adolescent girls ages 14–15 years, found significant improvements in positive body image (body appreciation). Moreover, two out of six moderate quality studies found improvements in positive body image. This included an online psychoeducational intervention for adolescents (Franko et al., 2013) and a manualised peer support intervention for girls aged 12–14 years (McVey et al., 2003a). Both measured body-esteem as a proxy for positive body image. Finally, two out of three weak quality studies found improvements in positive body image. This included a cognitive dissonance-based intervention for female adolescents (Amaral et al., 2019) and a co-educational school-based workshop for 16–17 years olds (Sundgot-Borgen et al., 2019). They measured body appreciation and embodiment, respectively. See Table 4 for full details of each study's methodological quality assessment and rating.

3.6. Efficacy of interventions

3.6.1. Efficacy at improving aspects of positive body image

3.6.1.1. Body appreciation. Body appreciation was measured in six studies, with two finding significant improvements in the intervention group compared to the control. Two studies were of strong methodological quality (Guest et al., 2021; Halliwell, 2015). Of these, Halliwell et al. (2015) found improvements in the intervention cognitive dissonance group versus wait-list control from pre-to-post measurement, whereas Guest et al. (2021) did not find significant improvements in body appreciation following playing an appearance-related board game intervention compared to a control group playing a game about the human body. Applying a comparable intervention and pre-post design to Halliwell et al. (2015), Amaral et al. (2019) similarly found significant improvements at immediate post-intervention, though the study was of weak quality. Two yoga studies and one psychoeducation study resulted in no significant

Table 2
Information about content of interventions included in the review.

Author	Approach	Delivery	Duration	Content
Amaral et al. (2019)	Cognitive dissonance-based *(the Body Project)*	Manualised group-based sessions led by trained researchers	Four weekly 1-hour sessions	Portuguese translated version of the Body Project (Stice, Mazotti, Weibel, & Agras, 2000) using a scripted manual.
Buchholz et al. (2008)	Psycho-education *(BodySense)*	Expert-led group workshops, followed up with distribution of learning materials (e.g. newsletters).	One workshop each for (a) parents & coaches and (b) athletes. In total with subsequent newsletters, BodySense lasted 3 months.	Workshops and subsequent materials covered 10 areas of psych-education: 1. Eating attitudes and beliefs. 2. Diversity of body shapes and sizes. 3. Resisting pressures to diet. 4. Physical activity for enjoyment. 5. Helping athletes feel good about themselves. 6. Encouraging athletes to be assertive. 7. Modelling attitudes and behaviours. 8. Promoting balance between sport participation and life outside sport.
Cox et al. (2018)	Anusara yoga physical education	Group classes led by yoga instructor	12 weeks of two yoga classes (40-min & 75-min), with three classes in first week – totalling 25 classes.	With a focus on one or two key movements per class, instructor promoted: 1. Mindful movement of the body 2. Body functionality over objectification. 3. Body appreciation and growth in body's capacity. 4. Self-compassion.
Diedrichs et al. (2016)	Online information hub for mothers consisting of evidence-based advice on improving body image (of self and daughter). *(The Dove Self Esteem Project Website for Parents)*	Website, expert-initiated tailored pathway in intervention version 1; unstructured in version 2.	Mothers viewed website for 30 mins (daughters in another room), then were either given tailored weblinks to follow in version 1, or instructed to browse the website in version 2 (both for 2 weeks).	Brief articles written by professional experts in field of body image, designed to encourage behaviour change. The content addressed: 1. Developing resilience to unrealistic appearance ideals in media. 2. Understanding the consequences of appearance-focused conversations (e.g. "fat talk"). 3. The impact of appearance teasing and building resilience to it. 4. Modelling body image behaviours and attitudes. 5. Body appreciation and acceptance.
Franko et al. (2013)	Online holistic health education focused on body image *(BodiMojo)*	Online, self-directed	Four weekly 45-min classes in which students used Bodimojo	Interactive content targeting four main areas: 1. Reducing body dissatisfaction through media literacy and awareness of cultural appearance ideals. 2. Promoting healthy body image. 3. Promoting healthy eating. 4. Promoting physical activity tailored to individuals.
Guest et al. (2021)	Educational board game *(Everybody's Different)*	Classroom-based, facilitated by researcher	Played once for 40-mins	Team-based board game in which children answer questions related to appearance to progress. Questions pertain to: 1. Positive body image 2. Conditions that affect people's appearance (visible difference) 3. Diversity of appearance 4. Appearance conversations ("body talk") 5. Appearance-related teasing and bullying. 6. Appearance ideals in the media.
Halliwell et al. (2015)	Cognitive dissonance-based (adapted from the *Succeed Body Image Programme)*	Classroom-based, facilitated by two undergraduate psychology students trained as peer leaders.	Single 1-hour session	Truncated version of the Succeed Body Image Programme, covering: 1. The thin ideal of female appearance. 2. The cost of pursuing the thin ideal. 3. Challenging negative appearance talk. 4. Role plays in which participants are instructed to persuade their friend not to pursue the thin ideal. 5. Body activism planning. 6. Self-affirmation exercise.

(*continued on next page*)

Table 2 (*continued*)

Author	Approach	Delivery	Duration	Content
Halliwell et al. (2018)	Yoga	School class-based led by qualified yoga instructor	Four weekly 40-min lessons	Yoga with the following components in each session: 1. Warrior sequence where children link positive self-concept memories to their body. 2. Storytelling guided by instructor on themes of (a) confidence, (b) independence and cooperation (c) acting with integrity and (d) inner beauty over outer beauty. 3. Breathing exercises to engage concentration, stamina, and breathing regulation. 4. Relaxation exercise
McVey et al. (2003a)	Peer support *(Girl Talk)*	Manualised school class-based facilitated by trained public health nurses	Ten weekly 1-hour sessions	Interactive group activities on the following topics: 1. Media literacy concerning the thin ideal. 2. Body acceptance and appreciation. 3. Set-point theory and the body's resistance to dieting. 4. Healthy eating and lifestyle. 5. Stress management techniques. 6. Promoting healthy relationships.
McVey et al. (2003b)	Peer support *(Girl Talk)*	Manualised school class-based facilitated by trained public health nurses	Ten weekly 1-hour sessions	Interactive group activities on: 1. Media literacy concerning the thin ideal. 2. Body acceptance and appreciation. 3. Set-point theory and the body's resistance to dieting. 4. Healthy eating and lifestyle. 5. Stress management techniques. 6. Promoting healthy relationships.
Regehr et al. (2020)	Interactive sessions based on media literacy and cognitive dissonance interventions	School-based led by a trained program facilitator	Six 55-min sessions; three classes (mixed gender) completed two sessions a week over 3 weeks, one girls-only classroom and one boys-only classroom received one session of the program a week over 6 weeks	Interactive sessions focusing on: 1. Appearance pressures and corresponding media messages. 2. How media is manipulated and the impact this has on the viewer. 3. Appreciation for one's body and internal characteristics. 4. Combating constraining appearance and behaviour stereotypes. 5. Teaching others about positive body image. 6. Identifying one's best possible self.
Sundgot-Borgen et al. (2019)	Interactive education on positive embodiment and health-related quality of life. *(the Healthy Body Image intervention)*	School class-based facilitated by two researchers	Three 90-min workshops 3 weeks apart	Interactive activities covering: 1. Body image – the impact of self-objectification and promoting body appreciation. 2. Media literacy – developing resilience against internalisation of appearance ideals. 3. Lifestyle – the dangers of idealised lifestyles e.g. extreme diet and exercise, and promoting self-care.
Yager et al. (2019)	Education sessions on drug / supplement use, strength training and sports nutrition (modified version of *the ATLAS Program)*	School class-based facilitated by usual physical education teacher and trained students	Five 90-min weekly classes.	Modified ATLAS Program (Goldberg et al., 1998) to include non-athletes, delivered in half the normal number of sessions (5 vs 10) for twice the session duration (90 vs 45-min). Sessions covered education on: 1. Exercise physiology and endocrinology. 2. Types of strength training and training safely. 3. Nutrition and supplements. 4. Media literacy regarding promotion of the muscular ideal. 5. Anabolic steroid use side effects.

Table 3
Overview of outcome measures used in included studies.

Positive Body Image-Related Construct	Outcome Measure	Properties	Psychometric Evidence	Studies in the Review Using Measure
Body Appreciation: the extent to which an individual appreciates, accepts, respects and feels favourable towards their body and its functionality.	Body Appreciation Scale (BAS;Avalos et al., (2005) Caetano; 2011 - Portugese version).	13 items, scored on 5-point Likert scale	Evidence of construct and internal validity and test-retest reliability at 3-weeks in adults (Avalos et al., 2005).	Amaral et al. (2019);Cox et al. (2017)
	Body Appreciation Scale-2 (BAS-2;Tylka & Wood-Barcalow 2015a).	10 items, scored on a 5-point Likert scale	Evidence of unidimensionality, internal consistency and test-retest reliability at three weeks in adults(Tylka & Wood-Barcalow, 2015a). Evidence of internal reliability in adolescent girls aged 14–15 years (Halliwell et al., 2015) and boys and girls aged 12–19 years (Lemoine et al., 2018).	Halliwell et al. (2015);Regehr et al. (2020)
	Body Appreciation Scale-2 for children (BAS-2-C;Halliwell et al. 2017) Functionality Satisfaction subscale of the Embodied Image Scale (EIS;Abbott & Barber, 2010)	10 items, 5-point Likert scale 3-item subscale, range 1–15.	Evidence of unidimensionality, internal consistency, construct validity and test-retest reliability for boy and girl aged 9–11 years (Halliwell et al., 2017). Evidence of adequate factor structure and internal consistency with males and females aged 12–17 years old (Abbott & Barber, 2010).	Guest et al. (2021);Halliwell et al. (2018) (Yager et al., 2019)
Body-esteem: how an individual thinks, feels, and evaluates their body and appearance. As a first-generation positive body image measure, examines positive evaluation of the body.	Body-Esteem Scale for Adults and Adolescents (BES-AA;Mendelson et al., 2001)	35-items, scored on 5-point Likert scale. Subscales: Physical/sexual attractiveness, upper body strength/ weight concern, physical condition.	Psychometric evidence of internal consistency and test-retest reliability at 3-months with males and females aged 12–25 years (Mendelson et al., 2001).	Buchholz et al. (2008);Franko et al. (2013);Halliwell et al., (2018);McVey et al. (2003a); McVey et al., (2003b);Yager et al. (2019);Diedrichs et al. (2016)
	BES for Children (BES-C; Mendelson & White, 1982; 1993)	13 items, 5-point Likert scale	Internal consistency and test-retest reliability at 2-weeks (Vander Wal & Thelen, 2000)	Halliwell et al. (2018)
Embodiment: experiences of living in one's body.	Experiences of Embodiment Scale (EES;Piran et al., 2020)		Psychometric evidence of convergent validity and internal consistency with adult women (Piran et al., 2020).	Sundgot-Borgen et al., 2019

Table 4
Methodological quality assessment of studies included in the review using the EHPP Quality Assessment Tool.

Authors/year	Selection Bias	Study Design	Confounders	Blinding	Data Collection Method	Withdrawals and Dropouts	Global Quality Rating
Amaral et al. (2019)	3	1	1	3	1	3	**3**
Buchholz et al. (2008)	2	1	3	3	1	3	**3**
Cox et al. (2017)	2	1	3	2	1	1	**2**
Diedrichs et al. (2016)	2	1	1	2	1	2	**1**
Franko et al. (2013)	**1**	**1**	**1**	**3**	**1**	**2**	**2**
Guest et al. (2021)	**1**	**1**	**1**	**2**	**1**	**1**	**1**
Halliwell et al. (2015)	2	1	1	2	1	1	**1**
Halliwell et al. (2018)	1	1	1	1	1	1	**1**
McVey et al. (2003) a	2	1	1	3	1	1	**2**
McVey et al. (2003) b	2	1	1	3	1	1	**2**
Regehr et al. (2020)	2	2	1	3	1	1	**2**
Yager, McClean & Li (2019)	2	1	3	2	1	2	**2**
Sundgot-Borgen et al. (2019)	2	1	1	3	1	3	**3**

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

differences between groups at post-intervention, one of which was of high quality (Halliwell et al., 2018) and the other two of moderate quality (Cox et al., 2017; Regehr et al., 2020). Moreover, Yager et al.'s (2019) moderate quality study measured functionality satisfaction/appreciation using the Functionality Satisfaction subscale of the Embodied Image Scale (Abbott & Barber, 2010). They found that functionality satisfaction improved pre-post intervention in the intervention group compared to the control group and was maintained at three-month follow-up. However, after adjusting for multiple comparisons, these findings were non-significant.

3.6.1.2. Body-esteem. Seven studies measured body-esteem. Of these, two strong quality studies found no significant improvements using an educational website for adolescent girls (Diedrichs et al., 2016) and a yoga intervention for girls and boys aged 9–11 years (Halliwell et al., 2018). However, two moderate quality studies found significant improvements compared to the control group. Franko et al. (2013) tested an online holistic health education intervention, using standard health education sessions as a control, finding improvements in girls, but not boys, at post-intervention but not at 3-month follow-up. Whereas, McVey *et al.* (2003) reported maintained improvements at 3-month follow-up in their study testing a peer support programme for girls compared to an inactive control group. However, the replication study by McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., (2003) did not find significant differences between intervention and inactive control group and body-esteem increased in both groups. The two remaining moderate studies, which both used psychoeducation and wait-list control groups, rated as being of moderate quality (Yager et al., 2019) and weak quality (Buchholz et al., 2008), found no improvements in body-esteem.

3.6.1.3. Positive embodiment. One weak quality group education study (Sundgot-Borgen et al., 2019) measured positive embodiment, finding significant improvements in the school-based psychoeducational intervention group compared to the inactive control in both boys and girls. Significance was not maintained at 3-months for boys but was up to 12-month follow-up for girls.

In summary, improvements in positive body image were found by studies using all outcomes. In particular, two out of seven studies measuring body-esteem (Franko et al., 2013; McVey *et al.* 2003), two out of six studies measuring body appreciation (Amaral et al., 2019; Halliwell et al., 2015), and the one study measuring positive embodiment (Sundgot-Borgen et al., 2019). Therefore, two studies measuring body-esteem as a first-generation proxy for positive body image found significant improvements, and three studies using second-generation measures to assess body appreciation and embodiment found significant improvements. Significant findings were identified across a range of studies using a number of outcome measures.

3.7. Efficacy of interventions across age groups

Studies recruited children and young people of various ages and differed in the size of their age range (e.g., some tested one school year group, others the entire high school range). As a common cross-cultural entry age to high school is 11, the studies have been separated into those recruiting ages (a) ≤ 11years and (b) 12–18 years.

Two studies recruited children aged ≤ 11, with one finding evidence of intervention efficacy. Both were rated strong for methodological quality. Guest et al. (2021) found no improvements in body appreciation after playing an educational appearance-based board game, and Halliwell et al. (2018) found no improvements in body appreciation or body-esteem compared to the PE lesson control group following a yoga-based intervention (both groups improved).

The remaining 11 studies included participants aged 12–18 years. Three of these studies reported significant improvements in intervention groups compared to controls and were of strong or moderate methodological quality. The strong study measured body appreciation following a cognitive dissonance group (versus wait-list control; Halliwell et al., 2015). The moderate quality studies tested body-esteem after an online holistic health intervention compared to standard health education (Franko et al., 2013) and a peer support programme compared to inactive control (McVey *et al.* 2003). The remaining studies either reported positive findings but were rated as weak quality (Amaral et al., 2019; Sundgot-Borgen et al., 2019), or found no differences between intervention and controls (Buchholz et al., 2008; Cox et al., 2017; Diedrichs et al., 2016; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Regehr et al., 2020; Yager et al., 2019).

Overall, none of the interventions for children aged 11 years or under found improvements in positive body image in the intervention group compared to the control group. Furthermore, three studies evaluating intervention for young people aged 12–18 years found improvements in positive body image (Diedrichs et al., 2021; Franko et al., 2013; Halliwell et al., 2015; McVey *et al.* 2003).

3.8. Efficacy of interventions by gender

Six studies recruited mixed-gender participants, three of which reported positive findings compared to controls. The one strong quality study by Guest et al. (2021) found no improvement in body appreciation from an educational board game.

Franko et al. (2013), who's study was assessed as moderate quality, applied an online educational programme compared to standard health education, and reported improved body-esteem in girls at post-intervention but this was not maintained at 3-month

follow-up. Sundgot-Borgen et al. (2019), whose study was rated as weak quality, found higher positive embodiment following interactive health and embodiment education sessions, compared to an inactive control, which were maintained for girls at 12-month follow-up but lost for boys from 3-months. Three studies reported no significant positive findings, including one strong quality study (Halliwell et al., 2018) and two moderate quality studies (Cox et al., 2017; Regehr et al., 2020).

Six studies exclusively recruited females. One strong quality study that applied a cognitive dissonance-based intervention compared to a wait-list control group (Halliwell et al., 2015) reported improved body appreciation, a moderate quality peer support study, utilising an inactive control group (McVey *et al.* 2003), found improved body-esteem. Additionally, a study rated as being of weak quality (Amaral et al., 2019) found a cognitive dissonance group increased participants' body appreciation compared to an inactive control. Three female-only studies found no significant differences between conditions (Buchholz et al., 2008; Diedrichs et al., 2016; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003). s.

Only Yager et al. (2019) tested an intervention exclusively with males, finding no positive results following education sessions focused on sports nutrition, drug use, and strength training in comparison with a wait-list control group in relation to body-esteem. There was a non-significant trend in relation to improvements in functionality satisfaction. This study was rated as having a moderate methodological quality.

In summary, two out of six studies evaluating interventions for mixed-gender groups (Franko et al., 2013; Sundgot-Borgen et al., 2019) and three out of six for females only (Amaral et al., 2019; Halliwell et al., 2015; McVey et al. 2003a) found evidence of efficacy at improving positive body image. However, the one male-only intervention did not find evidence of efficacy of improving positive body image (Yager et al., 2019).

3.9. Efficacy of interventions based on approach

3.9.1. Yoga

Two studies used yoga interventions, with none finding evidence of efficacy in relation to positive body image. Halliwell et al.'s (2018) strong study did not find any improvements in body appreciation following a yoga-based intervention compared physical education lessons as a control. Similarly, in a moderate study, Cox et al. (2017) did not find any improvements in body appreciation following of a yoga-based intervention compared to traditional physical education.

3.9.2. Cognitive dissonance

Of the three studies that used cognitive dissonance-based interventions, two found improvements in positive body image. Two studies used the same cognitive dissonance-based intervention, The Body Project. In a strong study, Halliwell et al. (2015) found that it was effective for improving body appreciation compared to a wait-list control. Similarly, Amaral et al. (2019) found that the Body Project was effective for improving body appreciation compared to an inactive control group, although this study was of weak methodological quality, hence findings must be interpreted with caution. Regehr et al. (2020), whose study was moderate quality, found no significant changes in body appreciation following a media literacy and cognitive dissonance-based intervention called Free to Be compared to an inactive control.

3.9.3. Psychoeducation

Nine studies used psychoeducation as an intervention, with three finding evidence of intervention efficacy for positive body image. The two included studies that were rated as having a strong methodological quality (Diedrichs et al., 2016; Dove Self-Esteem Project website; Guest et al., 2021, Everybody's Different: The Appearance Game) found no significant improvements in positive body image.

Four moderate studies (Franko et al., 2013, BodyMojo; McVey et al. 2003a, McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003, Girl Talk; Yager et al., 2019, ATLAS) also found mixed evidence of efficacy. Franko et al. (2013) only found improvements in girls' body-esteem following the BodyMojo intervention (active control). Similarly, McVey et al. (2003a) found improvements to body-esteem following the Girl Talk peer support intervention (inactive control). However, in a replication study using the same intervention, McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al. (2003) did not find improvements to body-esteem. Similarly, Yager and colleagues (2018) did not find any improvements to body-esteem following the educational ATLAS intervention compared to a wait-list control. However, there was a non-significant trend in relation to improvements in functionality satisfaction.

Finally, two weak studies (Buchholz et al., 2008, Body Sense; Sundgot-Borgen et al., 2019, the Healthy Body Image (HBI) intervention) also found mixed evidence of efficacy. Buchholz et al. (2008) found no improvements to body-esteem following the psychoeducational Body Sense intervention (wait-list control), whereas Sundgot-Borgen et al. (2019) found improvements to embodiment following the HBI intervention (inactive control). However, this study is of weak methodological quality so findings should be interpreted with caution.

In total, two out of three cognitive dissonance-based interventions (Amaral et al., 2019; Halliwell et al., 2015), and three out of nine psychoeducational interventions (Franko et al., 2013; McVey et al. 2003a; Sundgot-Borgen et al., 2019) found improvements in positive body image.

3.10. Efficacy of interventions based on delivery method

3.10.1. Self-directed

One of the three studies that used self-directed interventions (1 board game and 2 websites) found improvements in positive body image in the intervention group compared to the control. Two of these studies were of strong methodological quality and found no improvements in positive body image from an appearance-based board game compared to a board game about the human body (Guest et al., 2021; body appreciation) or the Dove Self Esteem Project website, which used an inactive control (Diedrichs et al., 2016; body-esteem). Diedrichs and colleagues' study utilised mother-daughter dyads and primarily targeted mothers. On the other hand, a moderate quality study by Franko et al. (2013), utilising another psychoeducational website (BodyMojo), did find improvements to body-esteem for girls, but not boys.

3.10.2. Student-directed

In two studies, the interventions were led by students. In a strong study, (Halliwell et al., 2015) found evidence of efficacy for a student-led intervention (The Body Project) for improving body appreciation. However, in a moderate study, Yager et al. (2019) found no evidence of efficacy for a student-led ATLAS intervention designed to improve body-esteem and functionality satisfaction (although there was a non-significant trend for the latter).

3.10.3. Physical activity instructor-directed

Three studies tested interventions delivered by physical activity instructors, with none finding significant improvements in positive body image. In a moderate study, Yager et al. (2019) tested the ATLAS programme, which was delivered by student "team leaders" (see above) and physical education teachers. The authors did not find this intervention to be effective for improving body-esteem compared to a wait-list control. However, functionality satisfaction did increase in the intervention group compared to the control, but this was a non-

significant finding. Two interventions, reported by Halliwell et al. (2018) and Cox et al. (2017), of strong and moderate quality respectively, were delivered by yoga instructors. However, neither found improvements in body appreciation.

3.10.4. Health professional-directed

Two studies of moderate methodological quality (McVey et al., 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003) tested interventions that were delivered by health professionals, with evidence of efficacy found in one study. McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al. (2003a; peer support) did not find the intervention they tested to be effective for improving body-esteem; however, McVey et al. (2003a) found Girl Talk, which was delivered by public health nurses, to be effective in improving body-esteem in adolescent girls.

3.10.5. ***Researcher-directed***

Two out of three studies, one of good (Diedrichs et al., 2016, structured condition) and two of weak (Amaral et al., 2019; Sundgot-Borgen et al., 2019) methodological quality found evidence of efficacy using interventions that were delivered by researchers. Amaral et al. (2019) found that the intervention they tested to be effective in improving body-esteem compared to an inactive control, and Sundgot-Borgen et al. (2019) found that their intervention was effective in improving embodiment compared to an inactive control. However, these findings are qualified by each of the studies being of weak methodological quality.

3.10.6. Other trained professionals

One moderate quality study (Regehr et al., 2020) tested an intervention that was delivered by trained professionals. Regehr et al. (2020) was administered by a programme facilitator who was trained by the primary author, and results found no improvements in body appreciation.

Overall, one out of three studies evaluating self-directed interventions (Franko et al., 2013), one of two student-directed interventions (Halliwell et al., 2015), no interventions led by a physical activity instructor, one in two studies using interventions led by health professionals (McVey et al., 2003a) and two out of three researcher-led (Amaral et al., 2019; Sundgot-Borgen et al., 2019) found evidence of efficacy in relation to positive body image.

3.11. Efficacy of interventions by intensity level

3.11.1. Single session

One of four studies that tested interventions that were delivered through a single session found evidence of intervention efficacy. One strong quality study (Halliwell et al., 2015) found increases in body appreciation, compared to a wait-list control, from a cognitive dissonance intervention delivered in a single one-hour session. Two strong quality studies did not find improvements in positive body image from single session interventions: Guest et al. (2021) found no improvements in body appreciation when children played an appearance-related educational board game for 40 min, compared to a game about the human body. Furthermore, Diedrichs et al. (2016) found no improvement in body-esteem from viewing a website for 30 min, compared to an inactive control group. Similarly, a weak quality study by Buchholz and colleagues (2008) also found no improvements in body-esteem from a single-session psychoeducational workshop compared to a wait-list control.

3.11.2. Multiple sessions

The remaining nine studies tested interventions delivered via multiple sessions, with four finding evidence of intervention efficacy. Sundgot-Borgen et al. (2019) found that an embodiment-based intervention, delivered over three 90-minute sessions, proved to be effective compared to an inactive control group. However, this study is of weak methodological quality, limiting its implications.

Four studies tested the efficacy of interventions delivered over more than one session for improving body appreciation, however only one reported evidence of efficacy. In Halliwell et al.'s (2018) strong study, the authors found that a yoga intervention, delivered over four 40-minute sessions, did not prove to be effective when compared to usual PE lessons. Similarly, in Cox et al.'s (2017) moderate study, the authors found that a yoga intervention, delivered over 25 sessions across 12 weeks, lasting between 40- and 75-minutes each, was not effective when compared to traditional physical education. Furthermore, the moderate quality study conducted by Regehr et al. (2020) found no changes to body appreciation following six 55-minute media literacy sessions, compared to an inactive control. In Amaral et al.'s (2019) weak study, the authors did find that a cognitive dissonance-based intervention, delivered over four one-hour sessions proved to be effective compared to an inactive control. However, as this study is of weak methodological quality, the results should be interpreted with caution.

Finally, five studies tested the efficacy of interventions delivered over multiple sessions for improving body-esteem. However, only two were efficacious. In two moderate studies, Yager et al. (2019) and McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al. (2003) found that the education and peer support interventions they tested delivered across five 90-minute and 10 one-hour sessions respectively, were not effective compared to wait-list and inactive controls, respectively. Nonetheless, two moderate studies (Franko et al., 2013; McVey et al., 2003a) found that their online health education, and peer support interventions were effective for improving body-esteem in girls compared to inactive control and active control groups. Franko et al. (2013) tested an intervention that was delivered across four 45-minute sessions, (McVey et al. 2003) tested an intervention that was delivered across 10 one-hour sessions.

In summary, one out of four single-session interventions (Halliwell et al., 2015), and four out of nine multiple-session interventions (Amaral et al., 2019; Franko et al., 2013; McVey et al., 2003,; Sundgot-Borgen et al., 2019) had evidence of efficacy as improving positive body image.

4. Discussion

To the authors' knowledge, this is the first systematic review to examine the evidence of efficacy of interventions developed to promote or improve positive body image in children and adolescents. Thirteen studies evaluating 12 interventions were identified as relevant to the aims of the review; however, the methodological quality of the studies was varied. Specific positive body image outcomes utilised in the reviewed studies included body appreciation and embodiment. Additionally, eight papers, evaluating seven interventions, used body-esteem as a proxy, which is a separate but related construct to positive body image. The most common type of intervention employed was psychoeducation, but the review also examined yoga, peer support, and cognitive dissonance-based interventions. Interventions were self-directed as well as guided by either undergraduate students, physical activity instructors, health professionals, or researchers. Intervention intensity ranged from single sessions under one-hour to multiple sessions spanning up to 12 weeks. Interventions for adolescent girls using cognitive dissonance (Halliwell et a., 2015; Amaral et al., 2019), peer support (McVey et al., 2003a), and online health psychoeducation (Franko et al., 2013) showed evidence of improving body appreciation and body-esteem. However, no interventions for younger children or boys had evidence of efficacy.

A key finding was that one strong study by Halliwell and colleagues (2015) showed evidence of intervention efficacy at improving body appreciation utilising one cognitive dissonance-based

session with a group of girls aged 14–15 years. These findings were supported by Amaral and colleagues' study, which also found improvements in body appreciation in adolescent girls who had taken part in a cognitive dissonance-based intervention; however, this study was rated as weak quality. Cognitive dissonance-based interventions have strong evidence of reducing body dissatisfaction (Stice, Marti, Spoor, Presnell, & Shaw, 2008). Therefore, it is a promising finding that this well-established intervention can also promote body appreciation. This finding is also supported theoretically: the writing and self-affirmation tasks included in cognitive dissonance interventions are theorised to influence the construct of body appreciation (Piran, 2015; Tylka & Wood-Barcalow, 2015b). In contrast, Guest and colleagues (2021) identified only one eligible cognitive dissonance-based study in their review of positive body image interventions with adults, which did not have evidence of improving body appreciation in a sample of male university students (Jankowski *et al.* 2017). In future, researchers could assess whether cognitive dissonance-based interventions for children and adolescents can be effective with mixed-gender or male-only groups.

The review also identified that peer support and psychoeducation-based interventions can improve body-esteem in adolescent girls, including up to 3-month follow-up (McVey et al., 2003a). This finding is promising as psychoeducation is relatively easy to implement; nonetheless, it would be useful to consider whether psychoeducational interventions can also promote specific aspects of positive body image, such as body appreciation, functionality appreciation, broad conceptualisations of beauty, and bodily self-care. Moreover, co-educational interventions using psychoeducation found less affects for boys (i.e., Franko et al., 2013). Therefore, the suitability of content for boys, and whether positive body manifests differently for them, should be considered.

Although there was some evidence of the efficacy of single-session interventions (e.g., Halliwell et al., 2015), overall, the findings suggest that multiple session interventions are more effective at improving positive body image in children and adolescents. For example, in their study testing an educational board game intervention, Guest et al. (2021) found from qualitative data the children reported learning key messages relating to positive body image (i.e., body appreciation, body acceptance, body functionality), but playing the game for 40-minutes was not sufficient to significantly increase positive body image. Therefore, the authors concluded that although the children had learned and understood concepts relating to positive body image, the game was not sufficient to change their own perception of their bodies. This also supports the findings from a meta-analysis of standalone body image interventions including those for children and young people carried out by Alleva, Sheeran, Webb, Martijn, and Miles (2015), who found that multiple session interventions were more effective than single session programmes. Therefore, future research should examine whether increasing the dosage of an intervention, or augmenting it with other interventional material, can improve its efficacy and maintain any improvements.

Findings in relation to who administered the intervention were largely inconclusive. There is some evidence from studies of strong or moderate methodological quality, for the efficacy of student and health professional (McVey et al., 2003a), and self-directed interventions for girls (Franko et al., 2013). Further exploration is necessary to better understand whether one type is more effective than another; nonetheless, this suggests interventions do not always need to be run by researchers, which is promising in terms of cost-effectiveness and being able to run interventions in real-world settings.

4.1. Methodological considerations

There were issues with the methodological quality of various studies included in the review. For example, seven studies in the review received a weak rating for blinding because both the researcher and participants were not blind to the condition they had been allocated to, or they failed to provide this information (Amaral et al., 2019; Buchholz et al., 2008; Franko et al., 2013; McVey et al., 2003a; McVey, Lieberman, Voorberg, Wardrope, Blackmore, et al., 2003; Regehr et al., 2020; Sundgot-Borgen et al., 2019). Furthermore, three of the studies were rated weak for withdrawals and dropouts (Amaral et al., 2019; Buchholz et al., 2008; Sundgot-Borgen et al., 2019) because they had an attrition rate of above 40% or did not report this information. Additionally, three studies were rated weak for confounders because they did not control for more than 60% of relevant confounding variables (Buchholz et al., 2008; Cox et al., 2017; Yager et al., 2019).

Three out of the four strong quality studies, and four out of six moderate quality studies, did not find improvements in positive body image, assessing body appreciation and body-esteem, following intervention. This highlights that there is currently very limited evidence of efficacy for interventions aimed at improving positive body image in children and young people which needs to be further explored. Moreover, two out of three weak quality studies found improvements in body appreciation and positive embodiment; however, the potential for bias in these studies makes it difficult to draw firm conclusions about their efficacy and they should be replicated using a stronger methodology to investigate whether the interventions are efficacious. Further details about the quality ratings for each study can be found in Table 4.

Although it can be difficult to address issues such as blinding, attrition, and selection bias in psychological research, particularly in school settings, it is difficult to draw firm conclusions about the efficacy of these interventions at present as there is a significant risk of bias (Guest et al., 2021). It would be of benefit to evaluate these interventions using more rigorous methodology to improve understanding of their efficacy. Moreover, in some cases authors do not report the necessary information to assess some aspects of methodological quality. The authors contacted the researchers to gain further clarification if the necessary information was not available, but this was no successful in all cases. Transparency concerning all aspects of methodology will help facilitate accurate identification of the methodological quality of research.

Although the review contributes to knowledge by identifying different types of intervention can be effective at increasing positive body image, the heterogeneity in design and outcome measurement means that it was not appropriate to conduct meta-analyses and therefore it was not possible to determine whether one approach is most effective. In addition to not being able to directly compare studies using different outcome measures, it is important to note that some used measures only validated in adult populations.

Additionally, as validated second-generation measures of positive body image for children and young people have only become available in the last five years, many of the studies relied on satisfaction-based measures of body-esteem to assess intervention efficacy at promoting positive body image. This makes it difficult to draw firm conclusions about the evidence of efficacy of these interventions in relation to positive body image and therefore it is necessary for researchers to continue to validate positive body image measures with children and utilise them within their research. Moreover, as with adults, much research focusses on body appreciation, rather than considering other potentially important aspects of positive body image (e.g., functionality, self-care, broad conceptualisations of beauty, body image flexibility).

Studies were carried out in a range of countries including Brazil, Canada, the USA, UK, Norway, and Australia. As such, this makes it difficult to generalise across cultures. This reflects the wider issue of cultural bias in psychological research and a lack of interventions tested with individuals from minority groups (Thornton, Keeling, & Ramsay-Wade, 2020). It is paramount that researchers conduct inclusive research and ensure that issues specific to different groups

and cultures are taken into account when designing interventions to improve positive body image more broadly.

4.2. Conclusions

In summary, this systematic review identified a small number of interventions with good evidence of efficacy of increasing body appreciation and body-esteem in adolescent girls using cognitive dissonance, peer support, and psychoeducation. This review has also identified that there is currently a lack of evidence of efficacy for interventions for children aged 11 years and under and for boys. Furthermore, some studies with significant favourable findings were rated as having low methodological quality and should be replicated with a more rigorous methodology before strong conclusions can be drawn.

It is important to note that this review has identified only a small number of effective positive body image interventions and many of the studies relied on measures that do not specifically assess components of positive body image or rely on measures that have not been validated in children and adolescents. To this end, more research is needed to rigorously evaluate interventions that aim to improve positive body image in children and adolescents using validated, second-generation outcome measures that assess different components of positive body image in children and adolescents (e.g., body functionality, self-care). Future research should also consider how the content of interventions may be adapted to make them relevant and impactful for boys, and to focus on promoting positive body image in young children.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.alcr.2021.100452.

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