




School-Based Interventions Improve Body Image and Media Literacy in Youth: A Systematic Review and Meta-Analysis

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Abstract

Body ideals conveyed by the media and by body comparisons often result in body dissatisfaction, which can cause risky health behaviours and eating disorders, especially in adolescents. We conducted a meta-analytic review of existing school-based interventions designed to enhance media literacy in order to reduce body dissatisfaction and to promote a positive body image. We included controlled trials examining children and adolescents from grade five to nine (age 10–15 years) after a manual search and a comprehensive literature search using PsycINFO, Medline, Web of Science, and CENTRAL. We computed average weighted effect sizes (Hedges' g) with the help of a random effects model and identified seventeen different programme evaluations with 7392 participants. We found a significantly larger effect on positive body image and media literacy in the intervention compared to control groups. However, heterogeneity was substantial for both outcomes. Results suggest that media literacy interventions have the potential to improve media literacy and reduce body dissatisfaction. Interventions that worked with the principle of induction of cognitive dissonance were the most effective.

Keywords Media literacy · Body dissatisfaction · Prevention program · Systematic review · Meta-analysis

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Introduction

The media are omnipresent for young people, especially in the form of social media such as Instagram, TikTok, SnapChat, and Facebook. According to previous research, 12–25 year olds spend an average of 3.7 h online each day, with social media being checked at least once a day by 96% (Albert et al., 2019). In the pandemic year 2020, online media consumption among young people increased to an average of 4.3 h per day (Rathgeb & Schmid, 2020). This high consumption may result in problems with self-esteem or certain mental health risks, e.g., eating disorders, caused by the exposure itself and/or by the effects of the specific content. Thus, the content of the media can lead to negative comparisons between one's own appearance and that of others or even discrimination, stigmatisation, and shaming (Latner et al., 2014). This may reduce self-esteem and influence body image or concerns about one's weight (Sikorski et al., 2016). The impact of social feedback is further increased by the fact that many social media users communicate not only with text messages, but also photos and videos (Carter et al., 2017). The link between body image, weight concerns, and the development of eating disorders (EDs) has proven to be particularly problematic for young people (McKnight Investigators, 2003; Wertheim et al., 2009; Wilksch, & Wade, 2010).

EDs are one of the most common mental illnesses in adolescence. Based on DSM-5 criteria (American Psychiatric Association, APA, 2013), the lifetime prevalence of clinically relevant EDs in girls and women is about 5.5%, whereas boys and men are affected by less than one percent. Although depression (5.8%) and anxiety disorders (19.5%) are more common over the lifetime, EDs develop, and are more prevalent, in adolescence and young adulthood (Wagner et al., 2017). Additionally, subthreshold EDs (which do not meet all diagnostic criteria) occur considerably more frequently, with a prevalence rate of 14% among adolescents (Nagl et al., 2016).

One common characteristic of EDs is body image disorder (synonyms: body schema disorder, shape disturbance), which also occurs often in body dysmorphic disorder (Dingemans et al., 2012; DSM-5, APA, 2013). Body image disorder manifests as body dissatisfaction in the form of excessive concerns about external appearance. Body image describes a person's perception of his or her own body in terms of attractiveness and aesthetics. Important factors influencing body image are emotions, attitudes, and comparisons with others (Cash, 2011). A negative body image is associated with low self-esteem, especially in adolescents, and is also associated with health-compromising behaviours, such as dieting, lower levels of physical activity, or binge eating (Neumark-Sztainer et al., 2006; Tiggemann, 2005). Hence, interventions to strengthen a positive body image and reduce body dissatisfaction are often found in prevention programmes for EDs (Chua et al., 2019) and explicitly recommended for anorexia nervosa (Junne et al., 2019). The onset of anorexia nervosa is as early as 12–15 years (Steinhausen & Jensen, 2015). Thus, primary preventive interventions, at the latest, should begin at this age. Although outside the scope of the present paper, programmes targeting older adolescents would need to be oriented toward secondary prevention and

have different (e.g., more eating disorder-specific) content than primary prevention interventions. To date, most ED-related interventions have been classroom-based, in an attempt to reach all youth (Watson et al., 2016).

In general, media literacy interventions aim to equip people with the skills needed to become critical consumers of media. Central to the influence of media on body image is the internalisation of the ideal of slimness; a culturally and socially promoted standard that equates beauty and attractiveness with slimness. ED prevention programs aim to challenge the slimness ideal and to reduce unhealthy appearance-based perceptions and ED symptoms (Levine & Harrison, 2009). Interventions often focus on the presentation of body images and recognition of image manipulation, for example, through software or lighting effects to make a person look slim. Such interventions also support distancing from media content that poses a threat to one's own positive body image, such as photos of extremely thin models (Tylka, 2012). However, media literacy prevention programmes for the prevention of EDs have also featured images containing athletic or thin ideals, which can also lead to increased body dissatisfaction (Robinson et al., 2017) or to a lower assessment of one's own attractiveness (Sherlock & Wagstaff, 2018).

Previous meta-analyses reported the general potential of promoting media literacy to reduce eating disorder risk factors (Bergsma & Carney, 2008; Jeong et al., 2012; Le et al., 2017; Watson et al., 2016). The systematic review by McLean et al. (2016a) specifically addressed the role of media literacy in connection with body dissatisfaction and EDs. Our review differs from previous work, focussing on the internalisation of the media's ideal, particularly social media, and on interventions for school settings.

Methods

Protocol and Registration

The review protocol was prospectively registered in PROSPERO international prospective register of systematic reviews (registration no. CRD42019128824; Kurz & Berger, 2019).

Eligibility Criteria

We included studies published from 2003 onwards, in English or German, examining children and adolescents from grades five to nine (ages 10–15 years), both with and without risk factors for eating disorders, high body dissatisfaction, or negative body image. We excluded samples with the diagnosis of an eating disorder, diabetes, or obesity and selected sub-populations (e.g., athletes) because they are not the focus of primary prevention.

Studies were eligible if they investigated media literacy in universal and selective prevention programs in schools that aimed to increase literacy and prevent or reduce body dissatisfaction or an associated effect (e.g., disordered eating or body

image). Primary outcomes were body image (operationalised as body dissatisfaction or amount of body self-esteem) and media literacy (being able to critically examine the presentation and internalization of the ideal of slimness).

We did not restrict inclusion to randomised-controlled trials, but also considered cluster-randomised, quasi-randomised, and non-randomised controlled trials to ensure a broad overview of all existing prevention programmes.

Information Sources and Search

We conducted a comprehensive literature search using the electronic databases PsycINFO, Medline, Web of Science Core Collection, and the Cochrane Central Register of Controlled Trials (CENTRAL) for eligible studies. Our search strategy included a combination of terms related to the concept of body (e.g., body dissatisfaction), media (e.g., media literacy), setting (e.g., school), study design (e.g., Randomised Controlled Trial, RCT), and type of intervention (e.g., prevention). The original search list is available from the first author upon request. We executed the last search on January 24, 2019. Additionally, we searched reference lists of eligible studies and relevant systematic reviews (Bergsma & Carney, 2008; McLean et al., 2016a; Pickhardt et al., 2018), as well as Google Scholar for further eligible material.

Study Selection

We first screened studies based on titles and abstracts to determine their relevance. We documented reasons for exclusion and included only one study of each intervention program. If multiple reports from the same study were available, we considered the one with the most complete information. For intervention programmes with existing modifications, we selected the study testing the most recent programme version.

Data Collection

We extracted the following information from the included trials: characteristics of the participants (mean age, gender), prevention measures (e.g., universal/selective), study (e.g., year, design), and outcome measures (e.g., body image). Additionally, we recorded relevant statistical data such as means, standard deviations, sample size, p values, and t or F statistics.

Risk of Bias in Individual Studies

Risk of bias of the included studies was assessed following the ROBINS-I tool (Sterne et al., 2016) and the Cochrane Risk of Bias Tool 2.0 (Sterne et al., 2019). We evaluated the risk of bias arising from: the allocation process, missing outcome data, measurement of the outcome (validated and standardised outcome measures),

the selection of the reported results, and risk of bias due to programme implementation (e.g., lack of manualisation).

Summary Measures and Synthesis of Results

First, for each outcome we used means and standard deviations to compute adjusted standardised mean differences (Hedges' g). If means and standard deviations were not reported, we used e.g., p values, standard errors, t and F statistics to calculate Hedges' g . We converted dichotomous data to Hedges' g as well (Deeks et al., 2019). We then pooled within-study data to get a summary statistic with a 95% confidence interval.

Second, we calculated a combined intervention effect as a weighted average of the single study effects. We used a random-effects meta-analysis approach to pool data across studies (DerSimonian & Laird, 1986). We interpreted Hedges' g within the same framework as Cohen's d , regarding 0.20, 0.50, and 0.80 as small, medium, and large effect sizes, respectively (Cohen, 1992). We analysed heterogeneity with a χ^2 test (Cochrane's Q) and I^2 statistics. I^2 represents the percentage of the between-study variability in effect estimates that cannot be explained by chance alone. I^2 values of 25%, 50%, and 75% are commonly interpreted as low, moderate, and high levels of heterogeneity, respectively (Deeks et al., 2019; Higgins et al., 2003).

Risk of Bias Across Studies

We visually inspected Funnel plots for asymmetry and tested it using Duval and Tweedie's trim and fill analysis (2000). We utilized Egger's regression test to analyse the relationship between study effect size and standard error (Egger et al., 1997). Additionally, we estimated Rosenthal's (1979) fail-safe N , as the number of unpublished studies with effect sizes of zero and a similar sample size that would be needed to bring the mean effect size to non-significance. Effect sizes are robust if the required number of unpublished studies is greater than or equal to $5n + 10$, where n is the number of studies in a meta-analysis (Rosenberg, 2005).

Additional Analyses

In addition to a total effect estimate pooled across all outcomes, we calculated stratified effect estimates for different types of outcomes, specifically for body image and media literacy. We further calculated prediction intervals for all pooled effect sizes. These intervals may represent the range of a possible underlying effect in a new study that is similar to the studies in the meta-analysis (Deeks et al., 2019; Riley et al., 2011). We conducted sensitivity analyses excluding outliers (effect sizes with confidence intervals not overlapping with the confidence interval of the pooled standardised mean difference; Cuijpers et al., 2014). Additionally, we examined the impact of type of prevention (universal vs selective) and study design (randomised or cluster-randomised studies vs studies using a non-randomised controlled design)

on outcomes by conducting subgroup analyses. We added prevention strategy (aims to reduce cognitive dissonance yes vs no) as a potential moderator because of the findings of a meta-analysis evaluating 68 dissonance-based eating disorder prevention programmes (Stice et al., 2019). According to Festinger's (1957) consistency theory, people generally strive to maintain consistency between their behaviours, beliefs, and attitudes. If faced with conflicting attitudes, beliefs, or behaviours, people usually experience psychological discomfort because of the state of cognitive dissonance. Intervention programmes, for example, offer discussion groups or role-playing to give participants the opportunity to address this phenomenon without persuasion or offering solutions. The latter can lead to psychological reactance, which is an unpleasant motivational state leading to unexpected and adverse behavioural, affective, or cognitive outcomes such as adopting beliefs that are contrary to what the intervention intended. Finally, we conducted meta-regression analyses to test the impact of publication year on outcomes. For all analyses, we used the Comprehensive Meta-Analysis software (Biostat. Inc., Version 3).

Results

Study Selection

We identified 2146 records with our electronic search. After adding records from our manual search and removing duplicates, we screened 1687 records for eligibility. Of those, 103 studies were deemed potentially eligible and examined in detail. Our final sample included 17 primary studies reporting effects of 16 prevention programmes (see Fig. 1).

Study Characteristics

The included studies with 8897 participants with data for post-assessment, and 7392 participants with data for post-assessment and follow-up. Females made up at least 47% of the sample (4178), although three studies did not report participant numbers separately for females and males. Table 1 shows characteristics of the included studies.

Interventions were aimed at eating disorder prevention ($n=11$) and on promoting positive body image ($n=5$) or well-being ($n=1$). All interventions contained at least one measure of body image (operationalised as positive body image or less body dissatisfaction). All interventions covered the conveyance of appearance ideals and the use of manipulative techniques by the media. Four of the included studies had sample sizes of fewer than 100 participants at post-assessment (Dysart, 2008; Halliwell et al., 2014; McLean et al., 2017; Rohde et al., 2014). Six of the programmes included female participants only (Dysart, 2008; Halliwell et al., 2014; McLean et al., 2017; Rohde et al., 2014; Sánchez-Carracedo et al., 2016; Sharpe et al., 2013). The mean age of the participants ranged from 11 to 15 years. Ten studies were randomised-controlled trials, six of which were cluster-randomised trials. Seven studies

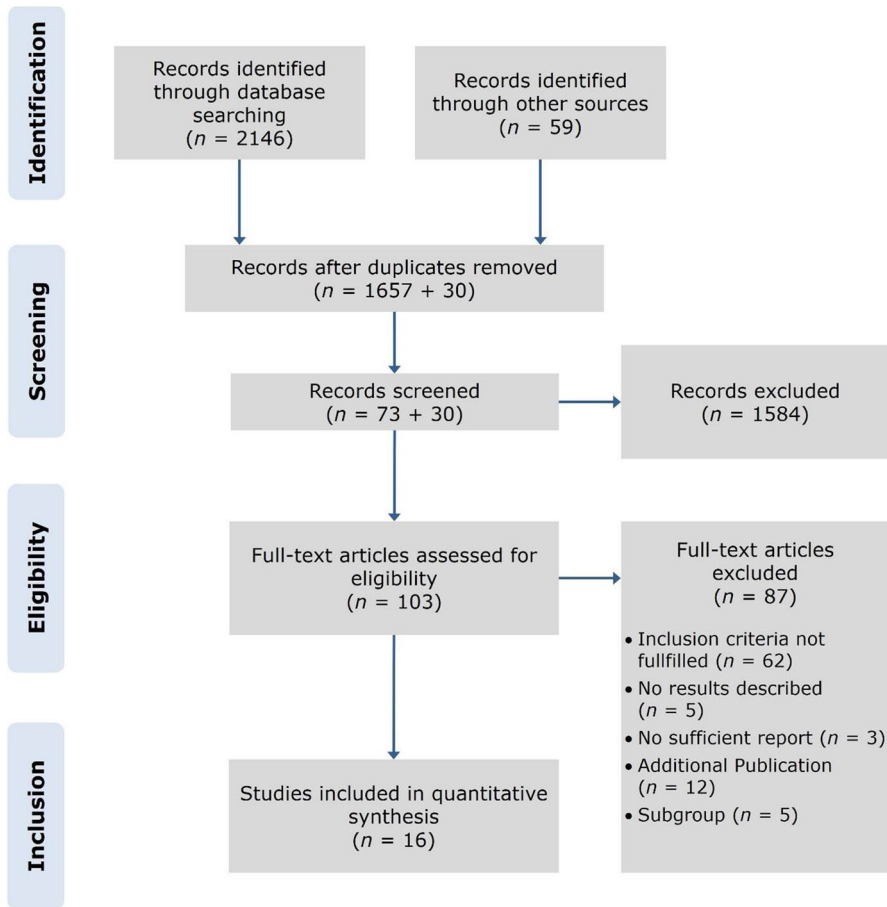


Fig. 1 Flow chart of the study selection process

used controlled designs without randomisation. Four programmes were pilot trials (Halliwell et al., 2014; McLean et al., 2017; Rohde et al., 2014; Sharpe et al., 2013). Two studies were unpublished doctoral theses (Batten, 2018; Dysart, 2008).

Risk of Bias Within Studies

We judged the risk of selection bias as high for the seven studies with a non-randomised design. Those studies tended to have smaller sample sizes and examined dissonance-based approaches (4/7) as well as selective prevention (3/7) more frequently than studies judged as low or unclear risk (3/10 and 1/10, respectively). Attrition rate was $> 15\%$ in six studies and in three studies the handling of missing data was inadequate, both indicating risk of attrition bias. Three studies used non-standardised measures for outcome assessment. All but three studies examined a manualised intervention (Halliwell et al., 2014; Jauregui-Lobera et al., 2010;

Table 1 Sample characteristics, study design, and program characteristics

Study	Program	N ^a total	N ^a Female	Mean age (SD)	Sex of target	Study design	Follow-up	Length and frequency	Type of prevention ^b	Dissonance based
Agam-Bitton et al. (2018)	In favour of myself	259 (224) nr		13.8 (0.6)	F & M	clusterRCT	3 mo	9×90 min	Universal	No
Batten (2018)	Body image kits	327 (293) nr (151)		12.4 (nr)	F & M	nonRCT	3 mo	5×50 min	Universal	Yes
Diedrichs et al. (2015)	Dove confident me: single session	1707 (1401) 860 (nr)		12.1 (0.7)	F & M	clusterRCT	1–2 mo	1×90 min	Universal	No
Dunstan et al. (2017)	Happy being me	200 (178) 200 (178)		12.7 (0.4)	F (& M) ^c	clusterRCT	6 mo	6×50 min	Universal, selective	Yes
Dysart (2008)	No title I	60 (70) ^d 60 (70)		14.6 (nr)	F	nonRCT	1.5–6 mo	8×40 min	Selective	Yes
Halliwell et al. (2014)	No title II	104 (88) 104 (88)		12.1 (0.3)	F	nonRCT	1 mo	4×20 min	Selective	Yes
Hinz, (2017)	My body and I	972 (906) 485 (452)		10.5 (1.1)	F & M	clusterRCT	nr	6×45 min	Universal	No
Jauregui-Lobera et al. (2010)	The girl's group	371 (344) 174 (nr)		14.7 (2.0)	F & M	nonRCT	nr	10×90 min	Universal	Yes
McLean et al. (2017)	The boost body confidence and social media savvy	101 (90) 101 (90)		13.1 (0.3)	F	nonRCT	nr	3×50 min	Selective	No
McVey et al. (2007)	Healthy schools—healthy kids	821 (687) nr (355)		11.3 (0.7)	F & M	clusterRCT	6 mo	8 mo (daily)	Universal	No
Richardson et al. (2009)	Dove bodythink	277 (258) 127 (nr)		12.7 (0.5)	F & M	nonRCT	3 mo	4×50 min	Universal	No
Rohde et al. (2014)	MS body project	81 (75)+ 81 (75) + 52 (50)		12.1 (0.9) + 12.5 (0.8)	F F	RCT	nr 3 mo	6×45 min	Selective, selective	Yes

Table 1 (continued)

Study	Program	N ^a total	N ^a Female	Mean age (SD)	Sex of target	Study design	Follow-up	Length and frequency	Type of prevention ^b	Dissonance based
Sánchez-Caracedo et al. (2016)	The mabic project	565 (466)	565 (466)	13.8 (0.5)	F	nonRCT	12 mo	8 + 1 × 60 min	Universal	Yes
Sharpe et al. (2013)	Me, you & us	448 (409)	448 (409)	13.1 (0.6)	F	clusterRCT	3 mo	6 × 50 min	Universal	No
Warschburger et al. (2018)	POPS (German)	1112 (772)		13.4	F & M	RCT	3–12 mo	9 × 45 min	Universal	No
Wilksch et al. (2015)	HELPP	698 (516)	447 ^c	13.2 (0.7) ^e	F & M	RCT	6–12 mo	8 × 50 min	Universal	Yes
Wilksch et al. (2015)	Media smart	742 (565)	474 ^c	13.2 (0.7) ^e	F & M	RCT	6–12 mo	8 × 50 min	Universal	No

F female, M male, RCT randomised controlled trial, nr not reported

^aSample size at baseline; sample size with valid data at all measurement points in brackets.

^bAll of the programs which were delivered co-educationally are universal prevention interventions and most programs for girls only are selective prevention interventions; in terms of Caplan (1964) all programs are primary prevention interventions.

^cThis program was delivered as a girls-only-intervention for one half of the sample ($n = 74$) and as a co-educative-intervention for the other half the sample; for both cases, only the results for the girls were reported ($n = 73$).

^dAdditional control group at follow-up.

^eThese values were not reported exactly in the original study because Wilksch et al. compared 3 different interventions, but one of them was not relevant for the meta-analyses; the authors reported only percentages of girls and boys and age information for the whole sample.

Richardson et al., 2009). Additionally, only four studies referred to a study protocol (Agam-Bitton et al., 2018; Sánchez-Carracedo et al., 2016; Sharpe et al., 2013; Warschburger & Zitzmann, 2018).

Intervention Effects on Body Image

For body image measured post intervention, a random-effects meta-analysis of all studies produced intervention effects ranging from small negative effects to medium-sized positive effects with six studies revealing significantly positive results (see Fig. 2). Two studies (Jauregui-Lobera et al., 2010; Rohde et al., 2014) were positive statistical outliers, while one study was a negative outlier (Agam-Bitton et al., 2018). Across all studies, a significantly positive small effect of $g = 0.16$ (95% CI [0.06, 0.26]) emerged. Heterogeneity was high. The 95% prediction intervals ranged

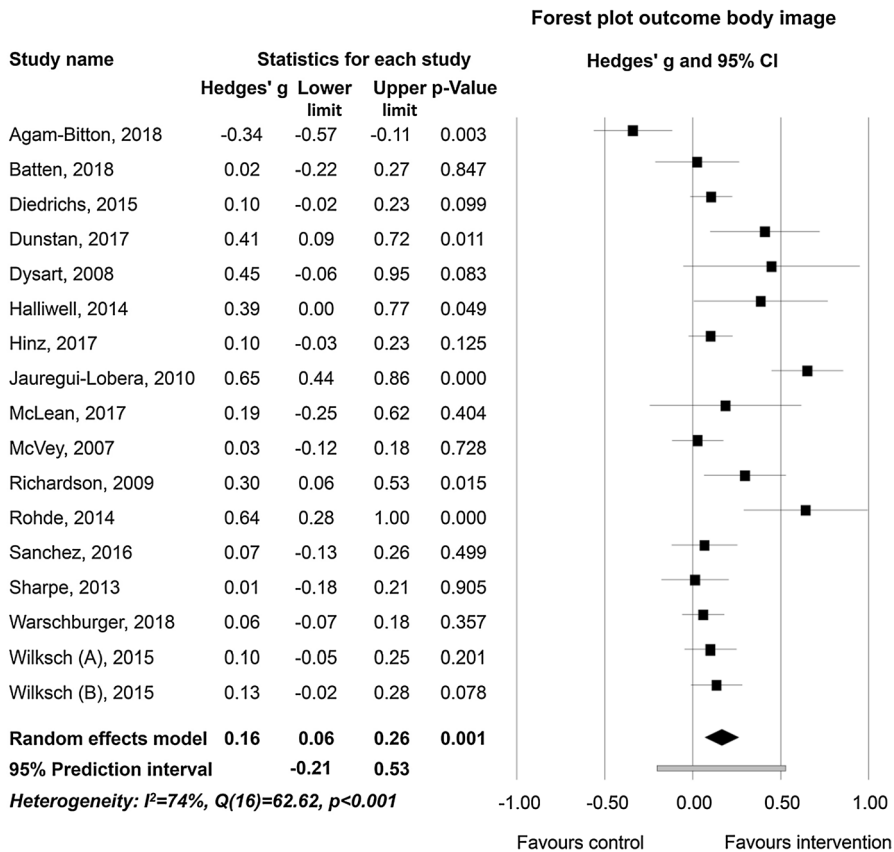


Fig. 2 Forest plot for the outcome body image. Note. This figure shows the study effect sizes (squares) along with 95% confidence intervals, the overall effect size (diamond), and the 95% prediction interval (grey bar). Positive effect sizes represent effects in favour of the intervention group. Wilksch (A) refers to the effects of HELPP, Wilksch (B) to the effects of Media smart (Color figure online)

from -0.21 to 0.53 indicating that the possible effect in any new study, that is similar to the studies in the meta-analysis, would fall into this range.

When excluding the outliers, the intervention effect on body image remained significant, yet reduced to $g=0.10$ ($0.06, 0.15$) with no heterogeneity (results not shown; available from the first author upon request). Intervention effects on body image dropped to zero at follow-up, $g=0.03$ ($-0.03, 0.100, n=14, p=0.298$). Heterogeneity was low ($I^2=23\%$, $Q=16.79, p=0.209$); the 95% prediction interval was from -0.11 to 0.17 . Two significant moderator effects emerged. As expected, selective prevention revealed significantly larger effects than universal prevention ($p_{\text{diff}}=0.025$) and dissonance-based prevention was more efficacious than other prevention approaches ($p_{\text{diff}}=0.010$). Studies with a randomised design showed smaller effects than controlled studies without randomisation, though the difference was not significant ($p_{\text{diff}}=0.120$). Heterogeneity remained substantial in all subgroups except selective prevention (results not shown; available from the first author upon request). Older studies had a trend toward reporting larger effects than newer studies ($\beta=-0.03, p=0.093, R^2=0.12$).

Intervention Effects on Media Literacy

Effects on media literacy ranged from small negative effects to medium-sized positive effects with 10 of 17 studies providing significant positive effects (see Fig. 3). One study appeared to be a negative outlier (Diedrichs et al., 2015). The average weighted effect across all studies was significantly positive but small, $g=0.24$ ($0.15, 0.34$). There was moderate heterogeneity of the study effects. The 95% prediction interval was quite broad at -0.10 to 0.59 .

When excluding the study with the outlying effect size, the overall effect did not change, $g=0.29$ ($0.20, 0.37$) and heterogeneity remained high (results not shown; available from the first author upon request). At follow-up, effect sizes remained stable, showing a significant small positive effect, $g=0.20$ ($0.10, 0.30$), $n=13, p<0.001$. Heterogeneity was moderate with $I^2=68\%$ ($Q=37.21, p<0.001$). The 95% prediction interval for follow-up effects ranged from -0.13 to 0.54 . Neither the type of prevention (selective vs. universal; $p=0.334$), prevention strategy ($p=0.573$), nor study design ($p=0.722$) had an impact on effect sizes. Heterogeneity remained substantial in all subgroups except selective prevention (results not shown; available from the first author upon request). Changes in media literacy were positively associated (but not significantly) with changes in body image ($\beta=0.45, p=0.069, R^2=0.15$). Publication year was not associated with effect size ($\beta=-0.02, p=0.146$).

Risk of Bias Across Studies

We tested publication bias of study results separately for body image and media literacy outcomes. For body image, a visual inspection of the funnel plot revealed an asymmetry (figure not shown; available from the first author upon request). Duval and Tweedie's (2000) trim and fill analysis resulted in three studies missing. When

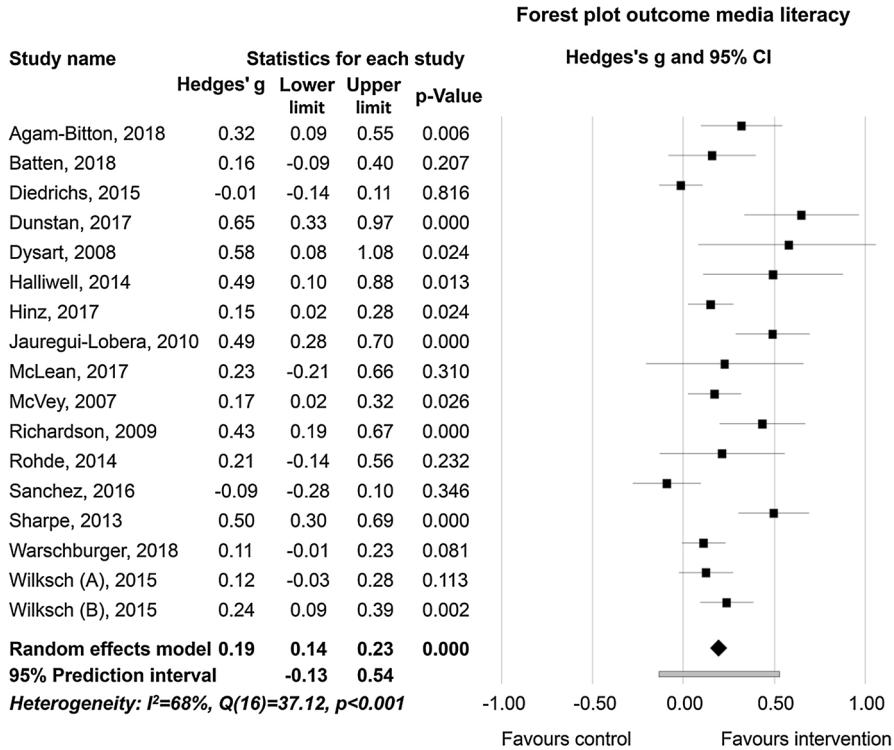


Fig. 3 Forest plot for the outcome media literacy. Note. This figure shows the study effect sizes (squares) along with 95% confidence intervals, the overall effect size (diamond), and the 95% prediction interval (grey bar). Positive effect sizes represent effects in favour of the intervention group. Wilksch (A) refers to the effects of HELPP, Wilksch (B) to the effects of Media smart (Color figure online)

considering the effect of these “missing” studies, the adjusted effect dropped to $g = 0.09$ (− 0.02, 0.20). Egger’s regression test gave no indication of publication bias, $t(15) = 1.64$, $p = 0.122$. Fail-safe N analysis showed a quite robust effect with 142 studies that would be needed to bring $\alpha > 0.05$. A visual inspection of the funnel plot for media literacy outcomes indicated two missing studies (figure not shown; available from the first author upon request). However, the adjusted effect did not change $g = 0.22$ (0.12, 0.31). Egger’s regression test was significant and gave an indication for publication bias, $t(15) = 2.76$, $p = 0.015$. Altogether, results proved to be robust since fail safe N revealed that 355 studies would be needed to achieve $\alpha > 0.05$.

Discussion

Summary of Evidence

We examined 17 evaluated media literacy interventions. Although the results revealed significant effects related to improvements in media literacy and body image, the effect size of the interventions was low. No studies showed negative effects in the intervention group. At follow-up, effects remained stable in most cases. All programmes had a positive effect on at least one targeted outcome related to media literacy or body dissatisfaction. Effect sizes were larger when promoting media literacy than for reducing body dissatisfaction. However, these effects are difficult to disentangle, as socio-cultural influences are assumed to correlate with negative body image (Becker et al., 2005). These influences include the internalisation of the slimness ideal, which is associated with body image concerns (Grabe et al., 2008).

Compared to other ED prevention programmes, which also address the internalisation of the slimness ideal but not explicitly media literacy, the effect strengths of the interventions we assessed were rather small. For instance, Stice and colleagues (2019) found effect sizes of $d=0.42$ on average. In line with their findings, our moderator analysis also revealed significantly larger effect sizes for dissonance-based eating disorder prevention programmes for improved body dissatisfaction ($d=0.30$) compared to non-dissonance-based programmes ($d=0.06$). Similarly, selective prevention interventions were found to be significantly more effective than universal prevention interventions in our meta-analysis ($d=0.43$ compared to $d=0.12$).

Limitations

The generalisability of our results is limited because of considerable heterogeneity ($I^2 > 66\%$) of study effects included in our meta-analysis. This might be due to large differences in the samples of the individual studies with regard to the number of participants, age, and gender, as well as study design. The methodology and instruments used in the programmes also differed. For instance, only ten studies employed an RCT. Four were pilot studies. Only three programmes had a longer follow-up period of 12 months. If evaluations are conducted after too short a period of time, intervention effects may not be fully developed or potential risks of the intervention itself may not have been detected (Llewellyn-Bennett et al., 2016).

This meta-analytic review is limited to the efficacy of existing interventions enhancing media literacy and promoting a positive body image. Our literature search was limited to published studies and doctoral theses available online. The lack of consideration of other unpublished literature, and the selection of only one very meaningful publication per programme, may have distorted our analyses.

We excluded some potentially successful prevention programmes because they did not explicitly measure the characteristics of body dissatisfaction and media literacy. One reason for this is the small number of standardised measuring instruments

for media competence in the body image field, relative to measures of eating behaviour. Moreover, existing instruments focus only on certain components of media literacy, such as internalisation of the slimness ideal or socio-cultural pressure (e.g., SATAQ; Heinberg et al., 1995; Schaefer et al., 2015), failing to measure other effects of media messages, especially in social media, such as realism, critical thinking, and reflection (Arke & Primack, 2009; McLean et al., 2016b). The pilot intervention "The Boost Body Confidence and Social Media Savvy (Boost) Intervention" (McLean et al., 2017) is the only included intervention that used realism, scepticism, and critical thinking about media as measures of media literacy.

Implications for Future Research

There is clearly a great need for a standardised and valid instrument for measuring media literacy, which takes into account "new" social media, such as TikTok. Some programmes included in our meta-analysis also lacked a clear and theoretical foundation as well as a transparent description of their methods used. Most programmes aimed to reduce risk factors and strengthen protective factors. In rare cases, intervention development approaches or behavioural change theories such as social cognitive theory (Bandura, 1986) and the socio-ecological approach (Bronfenbrenner, 1979) were mentioned. Fortunately, many programmes in the body image field were based on the results of the meta-analysis of eating disorder prevention programmes conducted by Stice and colleagues (2007, 2019) and the successful intervention characteristics they identified. Hopefully, that analysis will continue to be updated regularly.

Actors in the prevention field should report procedures related to intervention development openly and transparently, also with regard to negative outcomes and aberrations. For interventions in the area of healthy eating and physical activity, the HEPS Inventory Tool is suitable for this purpose (Dadaczynski et al., 2010). This tool contains a questionnaire to address all relevant variables of the implementation process, such as stakeholders, characteristics of the target group, and structural conditions of the setting. Developers of health promotion programmes can also use the Intervention Mapping Approach (IMA [Bartholomew et al., 2006]). This approach builds a bridge between theory and practice by identifying and using existing theory-based experience.

Implications for Practice

To prevent body dissatisfaction, it is useful to select interventions that include media competence components. Interested parties, e.g., from the school or clinical sector, should ensure that programmes are available for a wide range of structural conditions, namely requirements of the setting, the target group, available time, and financial possibilities. Selected programmes should be based on consideration of their intervention approach, theoretical foundation, and the risk and protective factors they address. The results of our meta-analysis show greater effects for interventions carried out as selective prevention programs, e.g., separately for girls and boys. With

regard to the theoretical foundation, dissonance-based interventions were found to be significantly effective. In addition, programme evaluations should be conducted that assess both positive and potentially negative effects. In that regard, the study by Warschburger and colleagues (2018) is qualitatively outstanding because of its methodological quality, transparent theoretical foundation, and the didactic methods described. Only evaluated programmes that are of good methodological quality, theoretically well-founded, and with a low risk of bias should be selected to guide practice. Fortunately, manuals are available for almost all the interventions reviewed. These can assist in assessing how each intervention meets the needs of the target group and how to implement it effectively and efficiently.

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Declarations

Conflict of Interest The authors declare that they have no conflict of interest.

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*References included in the meta-analysis are marked with an asterisk

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