



Diedrichs, P. C., Atkinson, M. J., Garbett, K. M., & Leckie, G. (2021). Evaluating the "Dove Confident Me" Five-Session Body Image Intervention Delivered by Teachers in Schools: A Cluster Randomized Controlled Effectiveness Trial. *Journal of Adolescent Health, 68*(2), 331-341. <https://doi.org/10.1016/j.jadohealth.2020.10.001>

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[10.1016/j.jadohealth.2020.10.001](https://doi.org/10.1016/j.jadohealth.2020.10.001)

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Original article

Evaluating the “Dove Confident Me” Five-Session Body Image Intervention Delivered by Teachers in Schools: A Cluster Randomized Controlled Effectiveness Trial

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Article history: Received March 30, 2020; Accepted October 4, 2020

Keywords: Body image; Body dissatisfaction; Schools; Intervention; Adolescence; Task-shifting; Teachers



 See Related Editorial on p.229

A B S T R A C T

Purpose: Body dissatisfaction is common during adolescence and predicts poor psychological and physical health. Interventions have traditionally overrelied on delivery by external providers (e.g., researchers and psychologists), preventing scalability. This study evaluated the acceptability and effectiveness of a school-based body image intervention delivered by schoolteachers.

Methods: Six British schools participated in a pragmatic cluster randomized controlled trial. Girls and boys aged 11–13 years received the five-session intervention delivered by their teachers (n = 848) or lessons-as-usual control (n = 647) and were assessed at baseline, postintervention, and 2-, 6-, 12-, 24- and 36-month follow-up. The primary outcome was body image (body esteem), secondary outcomes included risk factors for body image (internalization of appearance ideals, sociocultural pressures, social comparisons, appearance-related teasing, and conversations), and tertiary outcomes included psychosocial well-being (negative affect, self-esteem, dietary restraint, and life engagement).

Results: Compared with the control group, intervention students demonstrated improvements in the primary outcome of body esteem at postintervention (Cohen's $d = .15$), 2-month ($d = .26$), and 6-month follow-up ($d = .15$). For girls, there was also a significant reduction in experienced appearance-related teasing at 6-month ($d = .24$) and 12-month ($d = .30$) follow-up. No other significant intervention effects were observed. The intervention was acceptable to students.

Conclusions: These findings present the longest sustained improvements in a cognitive-affective body image outcome observed among girls and boys during a teacher-led universal body image program to date. Intervention refinement and improved teacher training may further improve outcomes. Task-shifting intervention delivery to community providers to scale up interventions is a promising strategy.

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IMPLICATIONS AND CONTRIBUTION

Body dissatisfaction affects 25%–61% of adolescents and results in poor physical and mental health. Similar to many adolescent health interventions, few evidence-based body image interventions have been disseminated at scale. This study demonstrates the effectiveness of task-shifting intervention delivery to community providers to improve adolescent health and intervention scalability.

Conflicts of interest: P.C.D. is an independent research consultant to the Dove Self-Esteem Project global education initiative and was on their Global Advisory Board from 2013 to 2016. The authors declare no other potential conflicts of interest in relation to this work.

Clinical Trials Registration: ISRCTN16782819.

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An estimated 25%–61% of adolescents experience body dissatisfaction [1], which is a linchpin risk factor for mental and physical health problems during adolescence. It is the most potent modifiable risk factor for eating disorders and prospectively predicts depression, low self-esteem, unhealthy weight control practices, self-harm, smoking, and high-risk drinking [2–5]. Body dissatisfaction is also associated with avoidance of life activities during adolescence, including participation at school, attending social events, and seeking health care (Atkinson and Diedrichs, unpublished data, 2020). Progress has been made in developing effective body image interventions, particularly interventions delivered to high-risk adolescent girls by trained providers in small-group settings [6]. However, given the high prevalence of body image concerns across genders and that most schools are coeducational with limits on space and facilitator capacity, there is a need for mixed-gender interventions that are acceptable, effective, and scalable via community-based providers [7]. Evidence also suggests mixed-gender body image interventions can be as effective as single-gender interventions [8].

A systematic review of classroom-based body image interventions for adolescents identified 3 of 16 interventions produced sustained reductions in body dissatisfaction [7]. Effective interventions addressed internalization of cultural appearance ideals, media literacy, and appearance-related teasing, comparisons, and conversations; all of which have been shown to prospectively predict body dissatisfaction during early adolescence [9,10]. However, there was a lack of consistency in effects across trials on outcomes, and between genders, an overreliance on highly skilled external providers (i.e., psychologists and researchers), and intervention fidelity was rarely assessed.

Two subsequent trials evaluated teacher-led delivery with fidelity assessments and found task shifting to teachers promising. Sharpe et al. [11] found sustained improvements in body image among adolescents after receiving a six-session classroom-based intervention delivered by teachers. However, the intervention was only delivered to girls, and follow-up was limited to 3-months. Diedrichs et al. [12] found a single-session body image intervention delivered by teachers to girls and boys conferred benefits to body image; however, effects were short term (i.e., immediate postintervention) and only observed among girls. More recently, Buerger et al. [13] evaluated a five-session classroom-based intervention delivered by teachers without fidelity assessment. They found sustained improvements at 12-month follow-up on self-reported body image avoidance behaviors among girls and boys, but no effects for body image-related cognitions and affect. These studies present promising results for teacher-delivered interventions; however, more research with longer term follow-up and fidelity assessment is needed.

The present study extends research into task-shifting adolescent mental health interventions to community providers using a pragmatic cluster randomized controlled trial with the aims of evaluating the acceptability and effectiveness of a body image intervention delivered in classrooms by trained schoolteachers with follow-up to 3-years postintervention. We hypothesized that students who received the intervention would report greater improvements in body image and related psychosocial outcomes compared with lessons-as-usual control and that the intervention would be acceptable to students and teachers. As previous school-based body image intervention

trials have not produced a consistent pattern of results by gender between studies, we did not have a priori hypotheses for the direction of results by participant gender.

Methods

Trial design

A parallel two-arm cluster randomized controlled effectiveness trial was conducted. This was a pragmatic trial conducted in settings similar to the “real world” [14]. This included adopting a school setting, teacher-led delivery during classroom time, no strict exclusion criteria for students, comparison to routine lessons-as-usual, and data collection time points selected to align with school academic calendars. Schools were randomly allocated to receive the intervention or assessment-only control (routine classes as usual). Participants completed assessments at baseline and postintervention and then at 2-, 6-, 12-, 24, and 36-month follow-up. Before recruitment, the trial was approved by the university ethics internal review board and registered (ISRCTN16782819).

Participants

Participants were adolescents in Years 7 and 8 (aged 11–13 years) from six secondary schools in south England ($N = 1,495$; 51.4% boys). [Table 1](#) provides their demographic characteristics. Schools were eligible if they were (1) state-maintained and coeducational, (2) had ≥ 5 classes of enrolled students per year level, (3) able to include all Year 7 and/or Year 8 classes in the study, and (4) had an average or below national average proportion of students with special educational needs. Intervention schools had 6–8 classes per year level, with an average or below national average proportion of students claiming free school meals (free school meal status provides a proxy for workless families and families with one part-time worker only). Control schools had 9–10 classes per year level, with similar proportion of students to the intervention schools claiming free school meals. Schools were publicly funded academies or community schools. [Figure 1](#) outlines participant recruitment and retention.

The sample size for our repeated measures design was determined according to Twisk [15]. Assuming a small effect size of Cohen's d of .2 based on previous research [11], a moderate intra-individual correlation between repeated measures of .5, and setting power at .80, the sample size required to detect significance at the 5% level under individual randomization was 245 students per arm. Applying an inflation factor to account for school-level clustering [16], based on a conservative small intraclass correlation coefficient (ICC) of .01 [11], increased this requirement to 979 students per arm. Therefore, this study was underpowered to detect small effects but sufficiently powered to detect moderate effect sizes.

Procedure

Schools were invited to take part via email and teacher training events. Six schools agreed to participate and were randomized by the third author via a computer-generated block randomization list and sequential allocation ([Figure 1](#)). Informed active consent was obtained from school senior management (during recruitment), informed assent from parents (before

baseline assessment), and informed consent from students (at baseline assessment). Students completed questionnaires under standardized conditions supervised by their teachers and trained research staff. Approximately 1-week after baseline questionnaires, intervention schools received the intervention delivered by schoolteachers to whole classes (one session per week over 5 weeks; the ratio of one teacher to 20–30 students). Students in control schools took part in their usual scheduled lessons. All students completed follow-up questionnaires at postintervention (within 1-week of the final session) and at 2-, 6-, 12-, 24-, and 36-month follow-up. Blinding of students, teachers, and researchers was not possible because of the

nature of the intervention. The risk of bias from teachers and researchers was minimized because of anonymous self-report assessments. The risk of contagion was also minimized by randomizing at the school level. Participating schools received a £1,300 honorarium over 36 months, and students were entered into raffle prize draws for £10 gift vouchers at each time point.

Intervention

The intervention, *Dove Confident Me: 5-Session Workshop Series for Body Confidence*, consisted of five 45-minute interactive sessions (Table 2 provides content overview). The intervention

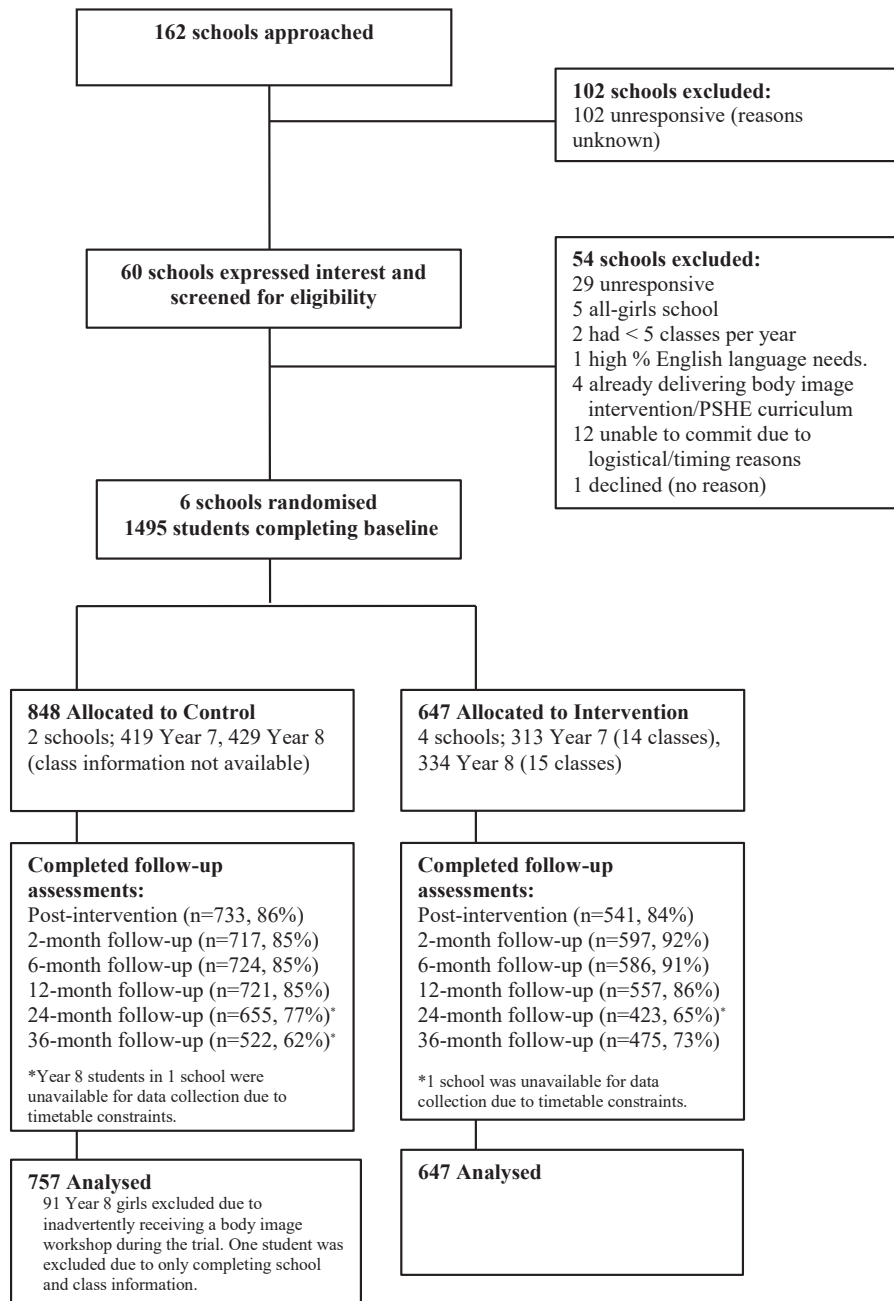


Figure 1. CONSORT diagram of participant recruitment and flow.

was grounded in an existing evidence-based program designed for classroom delivery, *Happy Being Me* [17,18]. Using a community-participatory approach, the intervention was cocreated through collaboration between adolescents, teachers, education experts, *Happy Being Me* authors (Drs Susan Paxton and Sian McLean), the *Dove Self-Esteem Project* (global education initiative by Unilever brand Dove), and the first three authors. *Happy Being Me's* content and design were adapted for a mixed-gender audience and teacher-led delivery to reflect contemporary adolescent media consumption (i.e., including traditional and social networking platforms) and to include new visual aids (e.g., video clips). Standardized materials included a detailed teacher guide for each session, PowerPoint slides, videos, and student activity sheets. Teachers received a standardized 2-hour in-person group training session facilitated by one of the study authors. Subsequent to the trial, the intervention materials were made freely available online (dove.com/selfesteem).

Confident Me is distinct from other effective, universal, school-based body image interventions in several ways. At 225 minutes in total, it is briefer than other multi-session interventions, which typically range in length from 300 to 450 minutes [11,13,19]. It also includes purpose-built videos created specifically to address the interventions' key messages, exercises designed to address adolescents' consumption and creation of social media imagery and messages, and the final lesson is dedicated to designing a group "take action project" for students to champion body confidence in their school and communities.

Measures

Demographic characteristics. Demographic information included self-reported gender, age, country of birth, language other than English spoken at home, ethnicity, height, and weight. Body mass

index was excluded from our analyses, as only 9.0% of girls and 12.4% of boys self-reported both their weight and height.

Outcome measures. Body esteem (a cognitive and affective component of body image) was assessed as the primary outcome, with secondary outcomes encompassing risk factors for body image and tertiary outcomes related to eating and broader mental health factors. Table 3 displays all outcome measures along with internal consistencies for the current sample. Aside from one measure to assess sociocultural appearance pressures constructed specifically for a previous school-based trial [12], measures were validated and have been used widely with adolescents.

Intervention acceptability. For intervention schools, acceptability was assessed at postintervention. Students rated perceived enjoyment, effectiveness, understanding, attention, comfort, teacher competence, relevance, and likelihood of future action and recommending the workshops to friends using 5-point scales (*not at all to very much*).

Intervention fidelity. Forty-two of 125 sessions (33.6%) were observed and assessed in person by trained research assistants. Teachers were also asked to audio record the delivery of their sessions (51% compliance rate; 64 sessions), which were assessed by trained research assistants. A standardized checklist was devised to assess adherence, competence, and achievement of learning outcomes for each session. A coding rubric encompassing key questions, actions, and required student responses deemed necessary for effective delivery (and as outlined in the intervention teacher guides) was used to determine the percentage of key content adhered to. Teacher competence was assessed via 12 items (e.g., ideas were expressed clearly,

Table 1
Baseline participant characteristics

	Intervention (n = 647)	Control (n = 756)	t (p)
Demographics			
Age at baseline, mean (SD)	11.69 (.63)	11.55 (.56)	4.31 (<.001)
Gender (girls), n (%)	307 (47.5)	328 (43.3)	2.48 (.119) ^a
Year level (Year 8), n (%)	333 (51.5)	338 (44.6)	6.65 (.010)^a
Born in the United Kingdom, n (%)	607 (94.1)	711 (94.7)	.24 (.642) ^a
Language other than English spoken, n (%)	71 (11)	56 (7.5)	5.45 (.025)^a
Ethnicity, n (%)			3.38 (.497) ^a
White	544 (85.7)	624 (84)	
Black	11 (1.7)	20 (2.7)	
Asian	14 (2.2)	13 (1.7)	
Mixed	22 (3.5)	22 (3)	
Outcomes			
Body esteem, mean (SE)	3.56 (.02)	3.68 (.01)	-2.80 (.005)
Internalization of appearance ideals, mean (SE)	2.07 (.02)	2.09 (.02)	-.41 (.682)
Sociocultural pressures, mean (SE)	1.49 (.01)	1.42 (.01)	2.05 (.040)
Sociocultural pressures (impact), mean (SE)	1.54 (.02)	1.41 (.01)	3.28 (.001)
Social comparisons, mean (SE)	2.21 (.02)	1.96 (.02)	4.56 (<.001)
Teasing (frequency), mean (SE)	1.86 (.02)	1.65 (.02)	4.16 (<.001)
Teasing (impact), mean (SE)	2.47 (.05)	2.09 (.06)	4.55 (<.001)
Appearance conversations, mean (SE)	1.85 (.02)	1.57 (.01)	5.91 (<.001)
Negative affect, mean (SE)	1.93 (.02)	1.72 (.02)	4.36 (<.001)
Self-esteem, mean (SE)	2.86 (.01)	2.86 (.01)	-.16 (.874)
Dietary restraint, mean (SE)	1.83 (.02)	1.85 (.02)	-.27 (.787)
Life engagement, mean (SE)	1.34 (.01)	1.31 (.01)	1.00 (.316)

Values for outcomes reflect combined estimates from imputed data sets.

Bold values are $p < .05$.

SD = standard deviation; SE = standard error.

^a Test statistics and p values for categorical variables are based on chi-squared tests.

prepared and organized, handled problems skillfully), using a 5-point Likert scale (1 = *not at all*; 5 = *very much*). Finally, the extent to which each of the three learning outcomes for each session was achieved was rated on a 10-point Likert scale (1 = *not at all*; 10 = *very much*). A selection of sessions with both audio and live observation (14%; 18 sessions) was used to assess interrater reliability via ICC.

Statistical analyses

Data preparation and baseline equivalence. Data were screened for outliers, normality and missing data. Missing data ranged from 1.3% to .1% across outcomes at baseline because of missed items within questionnaires and from 12.0% to 37.2% across follow-up because of student absences, missed items, and some schools being unable to accommodate data collection at 24- and 36-month follow-up time points. Little's Test of Missing Completely at Random was significant ($p < .001$), indicating data were not missing completely at random. Inspection of missing patterns indicated that most missing data over follow-up was because of student absence (i.e., all variables for a certain time point are missing) and inability to complete the questionnaire in the time allocated (i.e., missing data increased for variables placed near the end of the questionnaire). For each outcome, a t -test assessed baseline differences between students who dropped out after baseline (.86%–1.07%) and those who provided further data. Although the majority showed no differences, students reporting higher frequency of teasing and poorer life engagement were more likely to be missing after baseline ($p < .05$; although none were significant if multiplicity of testing was accounted for). A further series of t -tests showed that missingness was related to multiple variables at the same or previous time points ($p < .05$). Based on the above, we considered there was enough evidence to assume the data were not missing not at random and therefore suitable for multiple imputation to enable intent-to-treat analyses.

Missing data were imputed based on observable data at all assessment time points via multiple imputation in SPSS. Twenty data sets were imputed, separately for gender, using the fully conditional specification approach and Markov chain Monte Carlo methods as implemented in SPSS. All structural (school, year level, and class), demographic, and outcome variables were included in the imputation model. The results presented reflect analyses conducted on each data set and combined using Rubin's rules [29] to produce pooled estimates. Baseline equivalence on demographic and outcome measures was assessed using chi-square goodness-of-fit tests and t -tests for categorical and continuous variables, respectively. Note, as per Figure 1, the final sample included in analyses excluded 91 girls who inadvertently received another body image intervention during the trial.

Intervention effects. Intervention effects were assessed using longitudinal multilevel models in Stata 14 to account for the clustered nature of the data. Unconditional intercept-only models initially assessed nested levels as sources of outcome variance. Large ICCs were observed for student-level variance (.6–.8), but small ICCs across all outcomes at both class (<.01) and school levels (<.005); thus, only student-level random effects were retained. Nevertheless, we report conservative school-level cluster-robust standard errors (school-level cluster-robust standard errors allow for all arbitrary correlations between

students' outcomes from the same school and so implicitly account for class-level clustering) in place of the usual model-based standard errors for all regression coefficients to minimize the risk of making type I errors of inference. Final intervention models therefore contained a random intercept and slope over time at the individual level; fixed effects for Condition (coded 0 for control, 1 for intervention), Time (coded 0, 2, 6, 12, 24, 36 according to month from postintervention), Gender (coded 0 for boys, 1 for girls), and their interaction terms (condition \times time, gender \times condition, gender \times condition \times time), as well as covariates including baseline outcome score and demographic variables (gender, age, year level, and English speaking at home) to increase model precision. We also modeled best fit for the relationship between Time and the outcomes by including additional predictors of time-squared and time-cubed. Time was modeled as a cubic function in the final models, as the additional terms were significant for the majority of outcomes. Joint tests for fixed effects were assessed using Wald tests of significance.

Between-group differences at each time point were assessed using planned contrasts (intervention–control) on the adjusted means predicted from the model coefficients. Criterion for statistical significance regarding contrasts was adjusted to $p < .01$ to reduce the chance of Type 1 errors occurring because of multiple comparisons. Effect sizes were calculated by converting t -statistics to Cohen's d using the formula $d = 2t/\sqrt{N-2}$ [30]; small effect $d = .20$; medium effect $d = .50$, large effect $d = .80$.

Results

Intervention implementation and fidelity

Acceptable interrater reliability (ICCs $> .7$) was found for ratings of completion adherence (ICC = .85–.94), six teacher competencies (ICCs = .70–.85), and achievement of learning outcomes (ICCs = .74–.83), indicating consistent assessment across sessions and observers. Six competency items showing poor inter-rater reliability (ICCs = .35–.68) were removed from subsequent analysis. The mean session duration was 50 minutes (standard deviation [SD] = 4.46). Assessment of recommended versus actual timings for each section in each session indicated that, in general, teachers spent significantly longer than suggested on the first section of each session and significantly less on the last ($p < .05$). Program adherence for each session ranged from 68% to 92% of key content delivered ($M = 76\%$), with $>70\%$ considered to reflect acceptable adherence. Ratings of teacher competency ranged from 3.7 to 4.2 (out of 5; $M = 3.96$), with those scoring above 3.5 deemed to reflect good competency. Ratings for achieving the 15 learning outcomes ranged from 4.2 to 8.3 (out of 10; $M = 6.61$), with those >6 considered acceptable. Only three learning outcomes did not rate above six; these were all final learning outcomes in the session and, given the assessment of timings previously, likely because of teachers running out of time.

Baseline data

Baseline characteristics and tests of equivalence are reported in Table 1. Intervention schools were significantly older than control schools (as a result of excluding Year 8 girls from one control school) and had more students who spoke a

Table 2Dove confident me: five-session intervention content overview^a

Session	Topic and learning objectives ^b	Learning strategies ^c
1: Appearance ideals	Nature and consequences of appearance ideals <ul style="list-style-type: none"> • Understand the concept of societal appearance ideals. • Recognize pressures associated with aspiring to look like appearance ideals (time, money, emotions). • Identify ways to reject pressures to meet appearance ideals. • Practice recognizing nonappearance-based qualities. • Commit to rejecting appearance ideals. 	<ul style="list-style-type: none"> • Purpose-built animated video showing how appearance ideals have changed throughout the past century. • Defining appearance ideals in a written activity sheet. • Guided small-group and classroom discussions about the nature and costs associated with appearance ideals and way to reject them. • Self-affirmation written activity sheet.
2: Media messages	Media literacy <ul style="list-style-type: none"> • Identify sources of media (traditional and social media, professional- and user-created). • Identify techniques used to create media images (e.g., digital retouching, stylists, makeup artists, photographers, lighting, filters). • Analyze and critique the reasons why advertisements are created in a certain way to sell products. • Recognize that it is unfair to compare oneself to media images. • Practice ways to respond to media images. • Commit to taking action to challenge media pressures. 	<ul style="list-style-type: none"> • <i>Dove Evolution</i> video showing extensive steps taken to create media images, including digital manipulation. • Written activity sheet and classroom discussion about media image manipulation techniques. • Guided classroom discussion with visual stimuli on why media images are created in a certain way to sell products. • Written activity sheet about why it is not fair to compare oneself to media images. • Guided classroom discussion to generate strategies to challenge appearance pressures in the media.
3: Confront comparisons	Appearance-related social comparisons <ul style="list-style-type: none"> • Understand that people often engage in social comparisons. • Identify the downsides of comparing our appearance to another person's appearance. • Practice ways to avoid making appearance comparisons. • Commit to avoiding appearance comparisons. 	<ul style="list-style-type: none"> • <i>Dove Change One Thing</i> video demonstrating how we often compare our appearance to other people and want appearance attributes they have while they want appearance attributes another person has. • Guided classroom discussion using a “whirlpool of comparisons” analogy to identify how comparisons can create and reinforce unhelpful thought patterns. • Written activity sheet to identify the downsides of appearance comparisons. • Role-plays practicing how to avoid comparisons. • Three purpose-built short films demonstrating different types of body talk at school and at home. • Guided classroom discussion and written activity sheets to deconstruct the examples of body talk in the films and their negative consequences. • Role-plays practicing how to challenge body talk with peers. • Guided classroom discussion to identify ways to resist and challenge body talk.
4: Banish body talk	Appearance-based conversations and teasing <ul style="list-style-type: none"> • Understand the concept of “body talk,” including harmful appearance conversations and teasing. • Understand the negative consequences of engaging in, and overhearing, body talk. • Practice ways to avoid and respond to body talk. • Commit to not engaging in body talk. 	<ul style="list-style-type: none"> • Three videos demonstrating examples of body activism from real-life teenage advocates. • Written activity prompt sheet to record commitment to make individual behavioral changes. • Written activity sheet to guide the design of a campaign. • Class presentations to describe campaign plans and get feedback. • Verbal commitment to behavioral change.
5: Body confidence champions	Body activism <ul style="list-style-type: none"> • Describe the key messages from the previous four sessions. • Identify and commit to individual behavioral changes to challenge appearance ideals. • Plan a campaign to share the messages of the workshops with a broader audience. 	

^a Intervention materials can be viewed at dove.com/selfesteem.

^b Following an etiological approach to intervention development, the session topics were designed to address well-established influences on adolescent body image.

^c In accordance with evidence that efficacious body image interventions are interactive [9] and recommendations obtained from teachers and students during pilot testing and another trial of a single-session intervention with similar content [13], skills-based learning was facilitated through a variety of interactive group- and individual-based verbal, behavioral, and written learning strategies.

language other than English. Participants in intervention schools also reported greater severity than control on body esteem, frequency and related upset of teasing, perceived sociocultural pressures and related upset, appearance comparisons, appearance conversations, and negative affect. Differences were accounted for by including age, year level, English spoken at home, and baseline scores on all outcome measures as covariates in analyses.

Intervention effects on outcome measures

Full results of the multilevel models, including regression coefficients, predicted marginal means and standard errors, as well as raw means and standard deviations, can be found in [Supplementary Tables 5–7](#) (online only). There were no significant three-way interactions between condition, gender, and time. Joint tests of condition \times gender were approaching

Table 3
Outcome measures and internal consistencies (Cronbach's alphas for the current sample)

Outcome	Scale	α girls (n = 635)	α boys (n = 768)
Body image			
Body esteem	Body Esteem Scale for Adolescents & Adults [20] Weight and Appearance subscales combined, 18 items, mean score range 1–5. Higher scores indicate greater body esteem.	.95	.90
Risk factors			
Internalization of appearance ideals	Sociocultural Attitudes Towards Appearance Questionnaire-3 [21], General Internalization (9 items), and Athletic (5 items) subscales, mean score range 1–5. Higher scores indicate greater internationalization of appearance ideals.	.92	.95
Sociocultural pressures	Purpose-built measure derived from existing scales of sociocultural pressures [21,22] assessing “I've felt pressure to lose weight/change my body shape or build/have bigger muscles/change my appearance” from family/friends/media, 12 items, mean score range 1–5; and feeling of upset regarding pressures, 4 items. Higher scores indicate greater felt pressure and upset.	.87 .81	.90 .84
Social comparisons	Social Comparison to Models and Peers Scale [23] adapted to measure comparisons regarding “weight, body shape/build, face, and fashion/style” to “celebrities and people in the media,” and “other people my age,” 8 items, mean score range 1–5. Higher scores indicate greater tendency to make comparisons.	.85	.91
Appearance teasing	Project EAT-III Teasing Scale [24] adapted to assess frequency of teasing about appearance (frequency; 2 items) and feelings of upset about teasing about “weight & shape” and “the way you look” (impact; 2 items), mean score range 1–5. Higher scores indicate greater frequency and upset.	.70 .79	.72 .79
Appearance conversations	Appearance Conversations with Friends subscale of the Culture Among Friends [25], 5 items, mean score range 1–5. Higher scores indicate greater engagement in appearance conversations.	.82	.88
Psychosocial and disordered eating			
Negative affect	10-item positive and negative affect schedule for children [26] Negative affect subscale, 5 items, mean score range 1–5. Higher scores indicate greater negative affect.	.79	.87
Self-esteem	Rosenberg Self-Esteem Scale Shortened [27], 6 items, mean score range 1–4. Higher scores indicate greater self-esteem.	.70	.76
Dietary restraint	Dutch Eating Behaviour Questionnaire [28], Restraint Subscale, 10 items, mean score range 1–5. Higher scores indicate greater dietary restraint.	.91	.94
Life engagement	Body Image Life Engagement Questionnaire (Atkinson and Diedrichs, unpublished data, 2020), 10 items, mean score range 1–4, measure assessing the extent that worries or feeling bad about the way you look has stopped you, or are likely to stop you, from engaging in life activities (e.g., going to a social event, doing physical activity, giving an opinion, going to school). Higher scores indicate greater disengagement from life activities because of appearance concerns.	.90	.90

significance for teasing (frequency; $F = 2.86, p = .058$), socio-cultural pressures ($F = 2.97, p = .053$), and appearance conversations ($F = 2.48, p = .085$), and therefore, contrasts are reported separately for boys and girls for these outcomes.

Table 4 displays the results of planned contrasts between intervention and control conditions for all outcomes at each postintervention and follow-up time point. Students who received the intervention showed significantly higher body esteem than control at postintervention. These improvements were maintained at 2- and 6-month follow-up. For girls only, there was a significant reduction in the frequency of experiencing appearance-related teasing in the intervention group compared with control at 6- and 12-months. No other between-group differences met criteria for significance across the remaining risk factor or psychosocial and eating outcomes. However, we note improvements in self-esteem for girls and boys at 2- and 6-month follow-up and an unexpected increased frequency in appearance conversations among girls at 12-months, which sit on the significance threshold ($ps .016-.012$). All significant intervention effect sizes were small ($ds .13-.30$).

Program acceptability

Students reported moderate to high acceptability on enjoyment ($M = 3.04, SD = 1.18$), effectiveness ($M = 2.91, SD = 1.35$),

understanding ($M = 3.66, SD = 1.27$), attention paid ($M = 3.74, SD = 1.24$), comfort ($M = 3.55, SD = 1.30$), teacher competence ($M = 3.81, SD = 1.25$), likelihood of future action ($M = 3.23, SD = 1.30$), and likelihood to recommend the intervention to friends ($M = 3.19, SD = 1.35$).

Discussion

This study aimed to expand the evidence base for task-shifting adolescent mental health interventions to trained schoolteachers. As hypothesized, relative to the control group, the intervention produced improvements in girls' and boys' body image, maintained up to 6-months. This represents the longest sustained improvements in a cognitive-affective measure of body image observed in a universal school-based intervention with teacher-led delivery. Previous teacher-led interventions have produced improvements in body image up to 3-months later among girls when assessing cognitive aspects [11] or 12-months later when assessing self-reported body image avoidance behaviors [13]. Notably, the latter trial involved a significantly longer intervention and facilitator training than the present (five 90-minute sessions, 2-day training vs. five 45-minute sessions, 2-hour training). Furthermore, we observed improvements in self-esteem among girls and boys at 2-month and 6-month follow-up that sat on the significance threshold

Table 4
Between-group differences and effect sizes by time, based on adjusted marginal means^a

	Post	<i>p</i> (<i>d</i>)	2 months	<i>p</i> (<i>d</i>)	6 months	<i>p</i> (<i>d</i>)	12 months	<i>p</i> (<i>d</i>)	24 months	<i>p</i> (<i>d</i>)	36-months	<i>p</i> (<i>d</i>)
	M _{diff} (95% CI)		M _{diff} (95% CI)		M _{diff} (95% CI)		M _{diff} (95% CI)		M _{diff} (95% CI)		M _{diff} (95% CI)	
Body esteem	.05 (.01 to .09)	.008 (.14)	.05 (.02 to .09)	.002 (.17)	.05 (.02 to .09)	.006 (.15)	.05 (–.02 to .12)	.144 (.08)	.05 (–.1 to .21)	.506 (.04)	.05 (–.19 to .29)	.673 (.02)
Internalization	.1 (–.01 to .21)	.089 (.09)	.09 (–.01 to .19)	.077 (.09)	.08 (–.01 to .17)	.075 (.10)	.07 (–.03 to .17)	.171 (.07)	.04 (–.13 to .22)	.618 (.03)	.02 (–.25 to .29)	.895 (.01)
Sociocultural pressures												
Boys	.05 (0 to .1)	.032 (.16)	.05 (0 to .1)	.032 (.16)	.05 (0 to .1)	.045 (.14)	.04 (–.01 to .1)	.122 (.11)	.03 (–.05 to .12)	.44 (.06)	.02 (–.1 to .15)	.702 (.03)
Girls	.01 (–.05 to .06)	.820 (.02)	0 (–.04 to .05)	.834 (.02)	0 (–.03 to .03)	.919 (.01)	0 (–.05 to .04)	.891 (–.01)	–.01 (–.13 to .11)	.829 (–.02)	–.02 (–.22 to .18)	.821 (–.02)
Sociocultural pressures (impact)	.01 (–.06 to .08)	.804 (.01)	.01 (–.06 to .08)	.823 (.01)	.01 (–.07 to .09)	.869 (.01)	0 (–.1 to .11)	.930 (0)	0 (–.16 to .16)	.998 (0)	0 (–.23 to .23)	.972 (0)
Social comparisons	.01 (–.11 to .13)	.876 (.01)	.01 (–.11 to .13)	.902 (.01)	0 (–.13 to .14)	.952 (0)	0 (–.16 to .16)	.987 (0)	–.01 (–.25 to .23)	.920 (–.01)	–.02 (–.35 to .3)	.890 (–.01)
Teasing (frequency)												
Boys	.09 (–.01 to .19)	.067 (.13)	.09 (–.02 to .19)	.096 (.12)	.07 (–.04 to .18)	.205 (.09)	.05 (–.09 to .19)	.473 (.05)	.01 (–.2 to .22)	.944 (.01)	–.04 (–.33 to .26)	.813 (–.02)
Girls	–.1 (–.22 to .01)	.077 (–.14)	–.11 (–.2 to –.01)	.036 (–.17)	–.11 (–.19 to –.04)	.003 (–.24)	–.13 (–.19 to –.06)	0 (–.3)	–.15 (–.28 to .01)	.033 (–.17)	–.17 (–.41 to .06)	.155 (–.11)
Teasing (impact) ^b	0 (–.2 to .21)	.983 (0)	0 (–.2 to .19)	.968 (0)	–.03 (–.22 to .15)	.733 (–.02)	–.07 (–.27 to .12)	.464 (–.04)	–.16 (–.44 to .12)	.27 (–.06)	–.24 (–.64 to .17)	.252 (–.06)
Appearance conversations												
Boys	.04 (–.05 to .14)	.362 (.07)	.04 (–.05 to .13)	.384 (.06)	.03 (–.05 to .11)	.472 (.05)	.01 (–.07 to .1)	.736 (.02)	–.02 (–.15 to .12)	.815 (–.02)	–.05 (–.25 to .16)	.658 (–.03)
Girls	.16 (–.02 to .35)	.082 (.14)	.16 (–.01 to .32)	.058 (.15)	.15 (.02 to .27)	.024 (.18)	.13 (.03 to .23)	.012 (.20)	.1 (–.08 to .28)	.291 (.08)	.06 (–.25 to .38)	.691 (.03)
Negative affect	.03 (–.04 to .1)	.464 (.04)	.02 (–.05 to .09)	.628 (.03)	0 (–.07 to .07)	.963 (0)	–.03 (–.12 to .06)	.508 (–.04)	–.09 (–.23 to .06)	.242 (–.06)	–.14 (–.36 to .07)	.189 (–.07)
Self-esteem	.04 (0 to .08)	.032 (.11)	.04 (.01 to .07)	.016 (.13)	.03 (.01 to .05)	.013 (.13)	.02 (–.02 to .06)	.279 (.06)	0 (–.09 to .09)	.961 (0)	–.02 (–.16 to .13)	.824 (–.01)
Dietary restraint	–.02 (–.07 to .04)	.570 (–.03)	–.01 (–.06 to .04)	.677 (–.02)	0 (–.06 to .06)	.935 (0)	.01 (–.07 to .09)	.784 (.01)	.04 (–.1 to .18)	.590 (.03)	.06 (–.14 to .27)	.533 (.03)
Life engagement	–.01 (–.05 to .04)	.726 (–.02)	–.01 (–.05 to .03)	.659 (–.02)	–.01 (–.04 to .02)	.504 (–.04)	–.01 (–.04 to .02)	.373 (–.05)	–.02 (–.07 to .04)	.528 (–.03)	–.02 (–.12 to .07)	.630 (–.03)

M_{diff} = intervention–control; Threshold for significance is $p < .01$, indicated in bold.

CI = confidence interval.

^a Results are adjusted for baseline score, age, year level, English speaking at home.

^b Teasing (impact) was not imputed due to large numbers of participants reporting that they had not experienced appearance-related teasing, resulting in lower sample sizes for this variable.

and a significant reduction in self-reported frequency of experiencing appearance-based teasing among girls at 6- and 12-months. The intervention was acceptable, with students reporting good ratings of enjoyment, perceived effectiveness, and comfort.

Effect sizes were small, as commonly observed with community providers and universal samples [11–13,19,31]. Small effect sizes were also not surprising as teachers in this study varied greatly in specialism (i.e., English, history, physical education, social and emotional well-being, and science teachers took part in the study) and received minimal training (2-hours). Under a stepped care approach, interventions with small but reliable effects that can be delivered at scale are an important complement to more intensive interventions with larger effect sizes that are delivered to smaller numbers [32]. Through a unique industry and academic partnership, the intervention has since been disseminated to teachers online for free in 23 languages and has been implemented with approximately 20 million adolescents across 45 countries. Replication trials are underway in Portugal and India. Collectively, this study's results and the scale of implementation achieved demonstrate the appeal of this intervention and that task-shifting to community providers is a viable strategy to scale up the delivery of evidence-based adolescent mental health interventions.

Contrary to our hypotheses, the intervention did not produce significant improvements in other secondary and tertiary outcomes. Specifically, there were no improvements relative to the control group on internalization of appearance ideals, perceived sociocultural pressures, social comparisons, negative affect, dietary restraint, or life engagement. Other trials evaluating school-based interventions have produced inconsistent findings on body image risk factors and broader psychosocial outcomes when considering results across time points and between studies [11,13,19,31]. This suggests that other risk factors and intervention mechanisms not measured previously or in the present study may be involved and warrant future inquiry. Future research may also benefit from incorporating intervention techniques that have delivered robust effects by community providers in nonclassroom settings (e.g., cognitive dissonance approaches; [33]).

The absence of effects on secondary and tertiary outcomes may also be because of floor effects, as participants were mostly within normal ranges on these risk factors at baseline, and therefore—as is common in universal samples—there was limited scope for risk factor reduction [34]. Furthermore, the current sample aged 11–13 years was younger at baseline than comparable school-based intervention trials [11,13,19,31]. Meeting calls for prevention and early intervention [35], participants in the present study had not reached the most common onset period (15 years and over) for disordered eating and depression [36,37]. Similarly, at first glance, the stability of body image scores in the control group over time may also appear inconsistent with prior longitudinal research investigating singular patterns in body image over time, which has shown body satisfaction typically declines during adolescence [38]. However, we investigated the possibility of multiple developmental trajectories of body esteem within the present control group in a separate study [10]. Consistent with other studies that have also examined multiple trajectories [39,40], we found three developmental subgroups with varying stability in body image over time, which may not appear obvious by examining the mean body image scores for the entire control group presented here.

Nonetheless, it would be useful to assess the benefits of booster sessions to strengthen the effects of the intervention during later adolescence.

Fidelity was reasonably good with teachers delivering 75% of the intervention on average. This is comparable to another teacher-delivered body image intervention study (i.e., 50%–78%; [11]). Teachers dedicated more time than recommended to the first section of each session, and the mean time for lesson completion was 5-minutes longer than the 45-minutes allocated in the lesson plans. Training for teachers, many of whom had no prior experience teaching body image, was 2-hours of largely didactic presentation. Improving teacher training may increase adherence to session timings and produce sustained effects across more outcomes. Education research suggests ongoing interactive coaching enhances teacher adherence, although this is likely to be costly for an intervention delivered at scale [41]. Exploring cost-effective and scalable options for teacher training in body image interventions is a priority, particularly as research suggests teachers can lack confidence delivering this type of content [42]. Since this trial, a series of brief teacher training videos have been developed to complement the lesson plans. Based on observations in this trial, these videos emphasize the importance of preparation and allocating time appropriately to tasks. To aide with timely delivery, the lesson plans have also been revised to remove superfluous text and to make the suggested timings for each activity within the lessons clearer.

We observed one unexpected effect. Intervention girls reported more appearance-based conversations than the control group at 12-month follow-up (marginal effect). Concern is attenuated because of the measure assessing broad conversations about appearance without valence (i.e., “*My friends and I talk about the size and shape of our bodies*”), rather than specific conversation types that are known to increase body dissatisfaction (e.g., “*fat talk*,” e.g., “*I wish I was thinner*”; “*This outfit makes me look fat*”) [43]. Girls may have been discussing and implementing the intervention concepts (e.g., discussing why it is unfair to compare themselves to, or strive to meet, appearance ideals). Importantly, this effect was not present at any other time point and was not accompanied by increased body dissatisfaction. Nonetheless, future studies should pay careful attention to this finding and assess the nature of these conversations as well as frequency.

This study is one of the largest trials evaluating a body image intervention delivered by schoolteachers. Nevertheless, the sample size was underpowered to detect small effects when taking school-level clustering into account. Furthermore, we were unable to control for body mass index because of few students self-reporting their height and weight, and recording objective measurements was not feasible. Assessment of clinical significance was limited by too few students experiencing clinical-level concerns, perhaps because of the age and universal nature of the sample. Unfortunately, we were not provided with detailed information from the participating schools on reasons for some participants' absences on data collection days (i.e., sickness, being held back, or moving to different schools). We also experienced retention difficulties for two schools at 24- and 36-month follow-up; they chose not to give up school time for research participation as students had entered their senior years with more intensive timetables and examinations. Despite these limitations, this study has a number of strengths. Importantly, it assessed teacher-led delivery, which has rarely been studied in classroom-based body image interventions and is crucial for

improving the reach of these interventions. The study had the longest follow-up assessment period of any teacher-led body image intervention evaluated to date (3 years). Furthermore, the rigorous fidelity assessment provides useful context within which to interpret the findings.

Conclusions

This study evaluated a body image intervention delivered by schoolteachers that was cocreated by adolescents, teachers, academics and industry social purpose, media, and marketing experts. The effects for the primary outcome of body image and secondary outcomes of self-esteem and teasing (among girls) are promising. Students found the intervention acceptable. Refinements to the intervention and teacher training are recommended to improve the breadth and maintenance of effects. This study supports task-shifting the delivery of effective evidence-based interventions to community providers to enhance the scalability of adolescent mental health interventions.

Acknowledgments

Authors' contributions: P.C.D. conceived the study, led the design of the study and measures, participated in the interpretation of results, and led the drafting of the article. M.J.A. participated in the design of the study and measures, the interpretation of results, and drafting of the article, and designed and conducted the statistical analyses. K.M.G. participated in the design of the study, assisted with collecting the data, and participated in writing the article. G.L. consulted on the design and implementation of the statistical analyses, and participated in the drafting of the article. All authors read and approved the final article.

Funding Sources

This study was funded by a research grant from the Dove Self-Esteem Project, Unilever, United Kingdom. The funders had no role in the study design, data collection and analysis, decision to publish, or article preparation. They were permitted to review the article and suggest changes, but the authors exclusively retained the final decision on content.

Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jadohealth.2020.10.001>.

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