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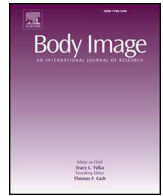
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Independent pragmatic replication of the *Dove Confident Me* body image program in an Australian Girls Independent Secondary School



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ABSTRACT

Following calls for the independent replication of universal body image programs under diverse conditions, this research aimed to investigate whether the universal co-educational prevention program developed for audiences in the United Kingdom (*Dove Confident Me*, DCM), was an acceptable and effective intervention when delivered by teachers to adolescent girls attending a single-sex Australian school. Comprising two studies, Study 1, evaluated DCM among Grade 8 students (N = 198) at a single-sex private school, and compared the results with students (N = 208) from a matched comparison group. No improvements were observed on outcome measures between the comparison and intervention girls over the three time points. Study 2 involved minor modifications to the aesthetics and content of the program, as well as the logistics of delivery. Delivered by teachers to Grade 8 students (N = 242 intervention and N = 354 comparison), there were significant improvements in acceptability of the modified DCM program, yet no interaction effects observed on outcome measures. While the program did no harm, it is possible that there are adjustments to the methods utilized and content of programs that are trialed in efforts to prevent body image concerns and eating disorders in the school setting.

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1. Introduction

Research over the past 40 years has pursued effective, school-based, universal prevention programs to improve body image and prevent eating disorders (Ciao, Loth, & Neumark-Sztainer, 2014; Diedrichs, Atkinson, Garbett, & Leckie, 2020; Schwartz et al., 2019; Wilksch, 2014). Schools have been identified as the ideal setting for implementation of body image programs (Sharpe, Schober, Treasure, & Schmidt, 2013; Torres, 2021; Yager, Diedrichs, Ricciardelli, & Halliwell, 2013), and systematic reviews suggest that the most promising prevention approaches include media literacy, cognitive dissonance, and healthy weight interventions (Ciao et al., 2014; Ghaderi et al., 2020; NEDC, 2017; Pursey et al., 2021; Stice et al., 2013; Stice et al., 2021), that are multi-session, interactive and etiological (Ciao et al., 2014; Schwartz et al., 2019; Stice & Shaw, 2004; Yager et al., 2013). Several effective programs now exist and have proceeded through the efficacy to effectiveness research and

dissemination process (Flay et al., 2005). The current project heeds the call for replication of existing programs in new contexts as opposed to the development of new programs (Ciao et al., 2014; Wilksch, 2014).

In a 2013 review, Yager et al. concluded that *Happy Being Me* (HBM) (Richardson, Durkin, & Paxton, 2007), a 3-session, etiological driven classroom-based intervention developed in Australia, demonstrated the most promising body image outcomes for girls. Incorporating etiological theory, HBM focused on reducing known causal risk factors for body dissatisfaction including internalization of the thin-ideal, body comparison, appearance-focused conversations, and appearance related teasing. The program effectively improved body image outcomes in researcher-delivered trials among Grade 7 girls in Australian girls' schools (Richardson & Paxton, 2010) and in UK trials in co-educational primary school samples with children aged 10–11 years (Bird, Halliwell, Diedrichs, & Harcourt, 2013). Expanding HBM to a 6-session, expert led, co-educational program (HBM Co-ed), Dunstan, Paxton, and McLean (2017) found similar outcomes for Grade 7 girls who participated in both single sex and co-educational classes. The authors suggested that adolescent girls engage as effectively in classroom-based body image

Abbreviations: DCM, *Dove Confident Me*; HBM, *Happy Being Me*

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programs in the presence of boys, as they do in single-sex classes (Dunstan et al., 2017).

In 2013, researchers collaborated with Dove to adapt the original HBM Program to suit both boys and girls between 11 and 13 years of age. The new program, titled *Dove Confident Me* (DCM), comprised two versions. The first was a 90-minute single-session intervention which was evaluated among a large ($n = 1707$) co-educational sample of 11–13-year-old boys and girls in the UK, resulting in a significant positive impact on primary outcome measures of body image and eating disorder risk in the groups delivered by both teachers and researchers at post-intervention (Diedrichs et al., 2015). The 5-session *Dove Confident Me* program, delivered by teachers, was evaluated in a large ($n = 1495$) school-based trial with a co-educational sample of boys and girls 11–13-years in the UK (Diedrichs et al., 2020). Results found improved body-esteem at post-intervention, maintained to 2-month and 6-month follow-up, and reduced appearance-based teasing for girls at 6-month and 12-month follow-up (Diedrichs et al., 2020).

Other teams have conducted replications of the DCM program, with mixed findings. An independent replication with a co-educational sample of 11–14-year-olds in Portugal reported significant improvements in body esteem and positive affect in girls, and reduced internalization of the athletic-ideal in boys, with both genders demonstrating improved affectivity and disordered eating at post-test compared to a control group (Torres, Vieira, Magalhaes, Campos, & Barbosa, 2018). A follow-up study examining gender and year-level differences reported that while most variables improved, self-esteem was the only one to reach significance, and the improvements were mainly evident in the Grade 7 and Grade 9 cohorts, while Grade 8 students seemed to get worse (Torres, Barbosa, & Vieira, 2021). An Indian study using expert facilitators with a co-educational sample of Grade 7 students found a culturally modified DCM program resulted in significant improvements in body esteem at post-test and 2-month follow-up and improved positive affect at post-test (Garbett et al., 2021). However, a UK study examining three teacher-led universal interventions (including DCM, a cognitive dissonance program, and a mindfulness program) with a large sample of Grade 8 students reported no improvement on any of the measurement outcomes for any of the interventions at post-test or at 6 and 12-month follow-up (Atkinson, Parnell, Treneman-Evans, & Diedrichs, 2021). Floor effects, teacher training, and inconsistent delivery between multiple schools have been suggested as possible explanations for the modest findings (Atkinson et al., 2021; Torres et al., 2021; Torres et al., 2018).

In support of thorough evaluation of intervention programs, Wilksch (2014) has criticized research in universal prevention centering around the generation of new programs, and instead suggested that energy be directed towards methodical and comprehensive evaluations of existing programs. Wilksch (2014) suggests that future directions for universal research include independent replication, evaluation in different countries, and effectiveness trials with endogenous program presenters. Echoing Wilksch, other leaders in the field have also provided support for rigorous, large, well-controlled, independent trials to assess efficacy for eating disorder prevention, and suggested future researchers focus on continued evaluation of programs under real-world conditions using endogenous facilitators (Ciao et al., 2014; Torres, 2021). To date, the effectiveness of DCM has not been examined in Australia, or in an all-girls setting. Thus, the current research heeds the calls to replicate existing programs and seeks to extend on previous findings by evaluating the efficacy and acceptability of the DCM program under real life conditions for a selective sample of Australian school girls attending a private single-sex school. This pragmatic replication seeks to determine whether DCM, which is intended for co-educational implementation, is an acceptable and effective intervention when delivered by teachers to girls educated

in a gender selective private school environment. Considered a selective prevention environment, a single-sex girl's school may be more conducive to the development of body image concerns and eating disorders, as they offer more opportunities to engage in appearance-based conversations and make body comparisons (Spencer, Barrett, Storti, & Cole, 2013), both of which contribute to body dissatisfaction (Jones, Vigfusdottir, & Lee, 2004; Myers & Crowther, 2009; Webb & Zimmer-Gembeck, 2013). Within a girl's school, appearance cultures and social norms in female friendship cliques may operate in a way that emphasize appearance related pressures for students educated in these environments (Carey, Donaghue, & Broderick, 2011; Hutchinson & Rapee, 2007; Paxton, Schultz, Wertheim, & Muir, 1999).

2. Study 1: independent pragmatic replication of dove confident me program

It was hypothesized that DCM will be an acceptable intervention for delivery within an Australian single sex girl's school setting and will result in significantly improved body image (body-esteem, body appreciation), self-esteem, and future plans for participants compared to a comparison group. Further, it is hypothesized that following participation in DCM, participants will report significant decreases in internalization of thin-ideal, negative affect, perceived sociocultural pressure, social comparison, appearance-based conversations, appearance-based teasing, barriers to life engagement and dietary restraint, compared to a comparison group. Finally, it is hypothesized that these outcomes will be maintained at the 3-month follow-up, and that the program will be deemed acceptable by teachers and students.

2.1. Study 1: methods

The project employed a quasi-experimental research design to conduct a pragmatic, controlled replication of the DCM program with Grade 8 girls attending an independent private girls' school in Australia. The intervention school was the school where the first author is employed as a school psychologist. All Grade 8 students in the intervention school participated in DCM as it had been incorporated into the wellbeing curriculum. Given the existing connection within the intervention school, the large cohort size, and the desire to avoid contamination of the comparison and intervention groups (Richardson & Paxton, 2010), a non-random allocation was selected, and three separate comparison schools were recruited. Of nine comparable girls' schools contacted, three agreed to participate in the study and formed the comparison group. Systematic reviews have indicated minimal difference between effect sizes when comparing trials involving randomized and non-randomized allocation (Stice, Shaw, Burton, & Wade, 2006), and non-randomized research design has been used with many other school-based interventions (Graeff-Martins et al., 2008; Richardson, Paxton, & Thomson, 2009; Richardson & Paxton, 2010), including the DCM evaluation research that the current study is replicating (Diedrichs et al., 2015; Diedrichs et al., 2020).

2.1.1. Participants

A total of 432 (intervention = 210, comparison = 222) girls aged between 12 and 15-years ($M = 13.3$, $SD = 0.49$) were recruited into the study. Twenty-six students (intervention $n = 12$, comparison $n = 14$) did not attempt to complete any of the three surveys and were removed from the sample. The final sample consisted of 198 students in the intervention group and 208 students in the comparison group. To match the size of the intervention group, the comparison group combined three cohorts from separate schools ($n = 46$, 74 and 88). Most students spoke English at home (77.6 %) and were born in Australia (78.3 %).

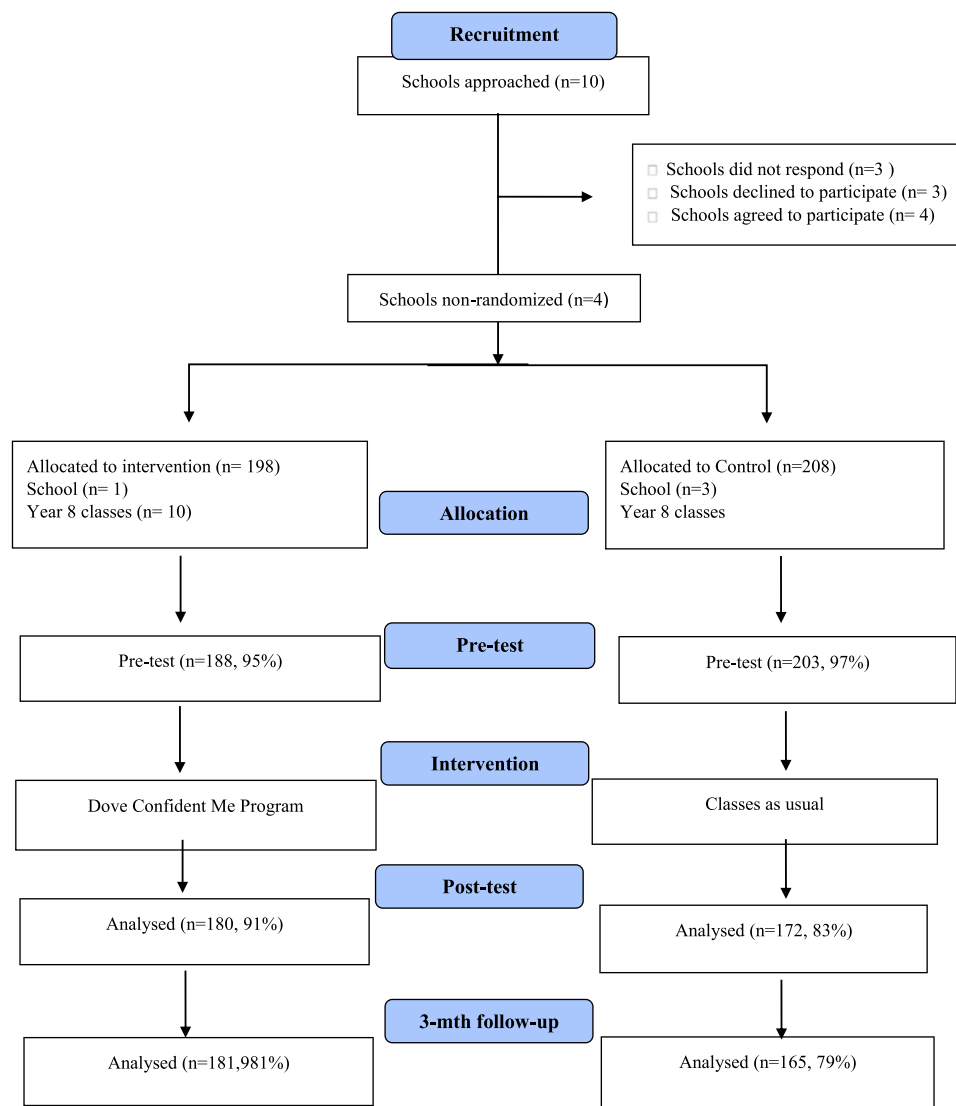


Fig. 1. Study 1: CONSORT diagram of recruitment and data collection.

2.1.2. Data collection

Passive informed consent was sought from each student and her parent/guardian prior to completion of research questionnaires and students were reminded that their participation was voluntary at each data collection point. All surveys took approximately 15-mins to complete and were administered in classes under standardized conditions supervised by a teacher. Responses were anonymized and data matching took place via assigning an ID-code to identify condition, and participants creating a unique code. The pre-test survey was administered in the week prior to the intervention commencing (October 2016) and links to the post-test and 3-month follow-up surveys were sent to participants immediately post (November 2016), and 3-months after (February 2017), the completion of DCM. Please see Fig. 1.

2.1.3. Measures

The study authors were in contact with, and utilized similar design, methods and measures used in research by Diedrichs et al. (2020) and Diedrichs et al. (2015). All scales, outlined in Table 1, were standardized and have been validated and widely used with adolescents.

2.1.4. Program implementation

Ten separate teachers delivered the DCM program between October- December in 2016. Teachers delivering the program were provided with two hours of training comprising background information about body image and DCM lesson plan familiarization. The DCM program is publicly available and described elsewhere (Diedrichs, 2020). Due to timetable constraints, DCM lessons were scheduled fortnightly and there were only four lessons available for program delivery. Thus, Sessions 4 and 5 of DCM were shortened and combined. In Session 4, two videos from the “How do we use body talk” section, and the final activity sheet in Session 5, “How can we change our world” were excluded. This shortening of the DCM program reflects the reality of conducting research in a real-life school setting and is representative of the way in which schools are likely to deliver DCM in real life conditions. The comparison group participated in their usual wellbeing lessons during the same time. These lessons included school administrative information, study information and other social and emotional curriculum, not including any body image content, as planned by each individual school.

Table 1
Self-reported measures and internal consistencies (Cronbach's alphas for current sample).

Outcome	Measures/Scales	Cronbach's alphas
Participant characteristics	Self-reported age, country of birth, language other than English spoken at home.	
Body esteem	Body Esteem Scale for Adolescents & Adults (Mendelson, Mendelson, & White, 2001), weight and appearance subscales combined, 18 items evaluating appearance and weight satisfaction (“I like what I look like in photos, I am happy with my weight”). Mean score, range 1–5 with negatively phrased items being reversed coded. Higher scores reflected greater body esteem.	.95
Body appreciation	Body Appreciation Scale (Avalos, Tylka, & Wood-Barcalow, 2005). Version modified by Diedrichs et al. (2015), 8 items assessing body appreciation (“I feel good about my body”). Mean score, range 1–5. Higher scores reflected greater body appreciation.	.95
Internalization of appearance ideals	Sociocultural Attitudes Towards Appearance Questionnaire-3 (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004). The internalization of the media ideal subscale, 8 items asking participants how much they agreed with an internalization statement (“I would like my body to look like the bodies who are on TV”). Mean score, range 1–5. Higher scores reflecting greater internalization of the thin-ideal.	.95
Sociocultural pressures	The Perceived Sociocultural Pressures scale , constructed by Diedrichs et al. (2015) and used in previous trials of DCM, was derived from the existing scales of sociocultural pressures (Stice & Bearman, 2001; Thompson et al., 2004). 12 items assessing perceived pressure to lose weight, change body shape, or change appearance, from mother/friends/media, and feelings related to the perceived pressure. Participants rated how much pressure they felt (“I’ve felt pressure to lose weight”), as well as how upset they felt by this pressure (“How upset are you by this pressure to lose weight?”). Mean score, range 1–5. Higher scores indicated greater perceived pressure and increased feeling of upset.	.90
Social comparisons	Social Comparison to Models and Peers Scale (Jones, 2001), 8 items, measuring comparisons about weight, body shape/build, face, and fashion sense/style to celebrities and people in the media, and peers (“How often do you compare your face to....”). Mean score, range 1–5. Higher scores reflecting greater social comparison.	.89
Appearance teasing	Project EAT-III Teasing Scale (Neumark-Sztainer et al., 2007) adapted by Diedrichs et al. (2015) measuring frequency of teasing and how upset one felt about the teasing during the past two weeks, 4 items, 2 items measuring frequency of teasing (“How often have you been teased about your weight or body shape?”) and 2 items assessing how upset one felt about the teasing (“How upset did you feel by this teasing?”). Mean score, range 1–5. Scores were averaged for frequency and impact separately, with higher scores reflecting greater frequency of teasing and increased impact (feeling upset).	.77
Appearance conversations	Appearance Conversations with Friends subscale of the culture among friends Appearance Conversation Scale (Jones et al., 2004) measuring frequency of appearance related talk. 5 items (“My friends and I talk about how our bodies look in clothes”). Mean score, range 1–5. Higher scores reflecting greater frequency of appearance related talk among peers.	.89
Negative affect	Negative affect subscale (Ebesutani et al., 2012) measuring negative affect (e.g. sad, miserable, afraid) over the past 2 weeks, 10 items, mean score, range 1–5. Positively phrased items were reversed coded and higher averaged scores indicate greater negative affect.	.88
Self-esteem	Rosenberg Self-esteem Scale shortened (Neumark-Sztainer et al., 2007; Rosenberg, 1965), 6 items measuring participant’s self-esteem (“On the whole I am happy with myself”). Mean score, range 1–4. Negatively phrased items were reversed coded and higher averaged scores indicated greater self-esteem.	.82
Dietary restraint	Dutch Eating Behaviour Questionnaire , (van Strien, Frijters, Bergers, & Defares, 1986), Restraint subscale, 10 items measuring dieting behaviours (“When you have put on weight do you eat less than usual?”). Mean score, range 1–5. Higher mean scores indicated higher levels of dietary restraint.	.94
Life engagement	The Life Engagement measure designed by Diedrichs et al. (2015) assessing the extent that worries, or feeling bad about the way you look, prevents one from engaging in life activities. 10 items, participants rating how much they have stopped engaging in a range of activities during the past fortnight (e.g. going to a social event, doing physical activity, giving an opinion, going to school) due to feeling bad about themselves. Mean score, range 1–5. Higher scores reflected less life engagement. This scale has been used in previous research with adolescents (Diedrichs et al., 2020; Diedrichs et al., 2015).	.87
Future plans	The Future Plans measure designed by Diedrichs et al. (personal communication February 18, 2016) was used to assess participants perceptions of their future plans. The 7-item measure asked participants to indicate how much they agreed with statements about their future (“I can do and be whatever I want in the future”). Mean score, range 1–5. Higher scores reflected more positive plans for the future.	.82
Program acceptability	Purpose built measure used in the original study (Diedrichs et al., 2015; Diedrichs et al., 2020). 5 items measuring participants impressions of the DCM program at post-test. Students were asked to rate (1- not at all - 5- very much) their enjoyment of the sessions, how helpful, comfortable, and important the sessions were, and how well the program was taught. Mean score, range 1–5. Higher scores indicated feedback that is more positive. At post-test, teachers were further asked to complete a 10-item evaluation sheet surveying their opinion (Disagree, neutral, agree) of the training program, the layout and structure of the DCM resources, and the appropriateness of the activities.	
Program attendance	Attendance at DCM sessions was measured via a self-report question on the post-test survey for intervention students. Participants were asked to indicate whether they did or did not attend each of the 4 sessions of DCM.	
Fidelity	As the DCM lessons were taught across 10 separate classes at the same time it was not possible to observe each teacher deliver the program. Thus, teacher fidelity to program content was measured via self-report. At the end of each session, teachers were asked to complete a checklist indicating the elements that they covered, in addition to providing any comments and feedback about the session.	

2.1.5. Data analysis

2.1.5.1. Data screening and preparation. Initial data preparation and analyses were conducted using SPSS (Version 24). Descriptive analyses screened for normality. Of the dependent variables, self-esteem, body-esteem, body satisfaction and internalization of thin-

ideal were normally distributed. The remaining variables were positively skewed, except for Future Plans, which was negatively skewed, thus square root transformations were applied to positively skewed variables and log transformations were applied to negatively skewed variables to improve normality (Pallant, 2016). An analysis of

Table 2
Teacher feedback ratings about DCM program.

	Disagree	Neutral	Agree
The training was adequate in preparing me to teach the program	14 %		86 %
I felt confident in delivering the lessons		14 %	85 %
The format of the lesson plans was easy to use	14 %	14 %	71 %
The material was developmentally appropriate for Yr 8 girls	14 %		86 %
The program was engaging for the students	28 %	14 %	57 %
The program was effective in enhancing body image in students	29 %	29 %	43 %
The program was the appropriate length		29 %	71 %
I think the school should implement the program again	28 %	14 %	57 %
I would teach this program again	14 %	14 %	71 %
I would recommend this program	29 %	14 %	57 %

Note: n = 7

intervention effects was conducted on both the transformed and untransformed data. As there were no differences in results, the findings are presented using transformed data.

2.1.5.2. Acceptability and intervention analysis. Similar to [Diedrichs et al. \(2020\)](#) acceptability ratings 1–5 were averaged and scores above 3.00 were considered to be high acceptability. Intervention effects were analyzed using longitudinal mixed models (LMM). LMM was selected due to the model’s four principal strengths: (1) accommodating missing data points often encountered in longitudinal datasets; (2) not requiring the same number of observations per subject; (3) allowing time to be continuous rather than fixed; and (4) increased flexibility regarding the covariance structure ([Chakraborty & Gu, 2009](#)). Furthermore, when dealing with large amounts of missing data (10–20 %), LMM is considered a more precise approach than multiple imputation or expectation-maximization algorithm ([von Hippel, 2007](#)). Preliminary analyses were conducted to determine the most appropriate LMM for each outcome variable. Four different models were considered and according to the Akaike Information Criterion ([Hastie et al., 2009](#)), the best fit was the model with a random effect for intercept. Thus, intervention effects were analysed using a mixed effects model that predicted each outcome as a function of fixed Group (intervention and comparison) and Time (pre-test, post-test, and three-month follow-up), and the interaction between Group x Time. The comparison group and the pretest measure were chosen as the reference category to compare the effects of intervention across time.

2.1.5.3. Power analysis. Sample size was determined according to [Twisk \(2003\)](#) and based on similar assumptions to previous research ([Diedrichs et al., 2020](#)). With the assumption of a small effect size of Cohen’s $d = .2$, an 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 randomization was 295 students per group ([Diedrichs et al., 2020](#)). Applying an inflation factor to account for school level clustering, based on the conservative intra-class correlation coefficient of .01, increased this requirement to 301 students per group. When adjusting for the assumption of a medium effect size of Cohen’s $d = .5$, the study required 47 students per group. Therefore, with 198 intervention and 208 comparison participants, this study is underpowered to detect small effects, but well powered to detect moderate effect sizes.

2.2. Study 1: results

2.2.1. Preliminary analysis

At post-test, missing data were 13.3 % ($n = 54$) increasing to 14.78 % ($n = 60$) at the 3-month follow-up. Missing data were assumed to be the result of a student being absent from school on the day of the data collection, or a student deciding to not complete the survey. Missing data were examined using Little’s Missing Completely at

Random test (MCAR; [Little, 1988](#)) and results indicated that the data were not missing at random [$\chi^2 (597) = 730.67, p = < .001$]. A similar finding occurred in [Diedrichs et al. \(2020\)](#) and adopting a comparable approach, closer inspection of the patterns of missing data revealed an increase in missing data for those variables positioned towards the end of the questionnaire, in addition to more missing data in the comparison group compared to intervention group. A series of independent groups t-tests of the baseline data identified that students who dropped out after baseline reported significantly greater internalization of the thin ideal, perceived sociocultural pressures, social comparison, appearance-based talk, dietary restraint, and barriers to life engagement, alongside significantly less self-esteem, body esteem and body satisfaction, compared to those students who proceeded with further data provision. An analysis of the intervention effects was conducted both including and excluding the students who dropped out after baseline. As there was no difference in any outcomes, results are presented using the included students who dropped out after baseline data. Attendance at DCM was good with 94 % of students in the intervention group indicating they participated in each of the four sessions of the program.

2.2.2. Program acceptability

Intervention participants ($n = 181$) rated DCM high acceptability regarding comfort ($M = 3.15, SD = 1.41$) and teacher effectiveness ($M = 3.10, SD = 1.40$), moderate acceptability regarding importance ($M = 2.91, SD = 1.41$), and low to moderate acceptability regarding enjoyment ($M = 2.22, SD = 1.14$) and helpfulness ($M = 1.90, SD = 1.14$). [Table 2](#) provides teacher feedback ratings. While teachers agreed the training was adequate, they felt confident delivering the lessons, and the material was developmentally appropriate, close to a third of teachers suggested the program was neither engaging nor effective.

2.2.3. Fidelity

Six out of 10 teachers returned the fidelity checklists for each of the four sessions. The checklists indicated that between 65 % and 100 % of Session 1 content was covered and between 80 % and 100 % of Sessions 2, 3 and 4 content was covered.

2.2.4. Baseline comparison of scores

[Table 3](#) outlines descriptive statistics for each measure at baseline, post-test and 3-month follow-up for the intervention and comparison groups. A series of independent groups t-tests found significant differences between the intervention and comparison groups at baseline on several variables. Specifically, the comparison group reported greater social comparison ($d = .45$), appearance-based talk ($d = .38$), sociocultural pressure ($d = .32$) and impairment in life engagement ($d = .33$) compared to the intervention group. While significant differences between the intervention and comparison group at baseline is consistent with previous research ([Diedrichs et al., 2020](#); [Dunstan et al., 2017](#)), these studies reported that the intervention group had greater baseline measurements compared to control. These findings were controlled for during subsequent analysis.

Table 3
Means, standard deviation, minimum and maximum of outcome variables by Time and Group.

Intervention	Intervention					Comparison					t (df)p
	n	M	SD	Min	Max	n	M	SD	Min	Max	
Self esteem											
Pre-test	188	2.76	.59	1.33	4.00	203	2.71	.59	1.17	4.00	.87(389), p = .05
Post	178	2.82	.58	1.33	4.00	172	2.82	.64	1.17	4.00	
3-mth	181	2.88	.59	1.50	4.00	165	2.83	.63	1.00	4.00	
Body esteem											
Pre-test	188	3.31	.88	1.11	4.94	201	3.14	.96	1.06	5.00	1.74(387), p = .08
Post	178	3.35	.85	1.17	5.00	170	3.29	.95	1.00	5.00	
3-mth	181	3.45	.80	1.00	5.00	165	3.35	.93	1.00	5.00	
Body appreciation											
Pre-test	187	3.61	.84	1.63	5.00	197	3.51	.89	1.75	5.00	1.13(382), p = .25
Post	178	3.62	.85	1.38	5.00	168	3.64	.90	1.38	5.00	
3-mth	181	3.66	.80	1.50	5.00	165	3.65	.89	1.50	5.00	
Internalization											
Pre-test	188	2.75	1.18	1.00	5.00	203	2.98	1.10	1.00	5.00	-1.95(389), p = .05
Post	179	2.59	1.18	1.00	5.00	172	2.81	1.15	1.00	5.00	
3-mth	181	2.56	1.09	1.00	5.00	165	2.67	1.14	1.00	5.00	
Social comparison											
Pre-test	188	2.37	.81	1.00	4.92	201	2.76	.88	1.00	4.83	-4.49(387), p < .01
Post	178	2.36	.81	1.00	4.00	169	2.60	.90	1.00	4.67	
3-mth	181	2.33	.83	1.00	5.00	165	2.49	.96	1.00	5.00	
Appearance teasing frequency											
Pre-test	187	1.51	.80	1.00	5.00	200	1.65	.90	1.00	5.00	-.21(116), p = .83
Post	180	1.52	.83	1.00	5.00	171	1.56	.86	1.00	5.00	
3-mth	181	1.37	.67	1.00	4.00	165	1.56	.92	1.00	5.00	
Appearance teasing impact											
Pre-test	187	1.10	1.31	1.00	5.00	200	1.41	1.57	.00	5.00	-.06(115), p = .95
Post	180	1.29	1.52	1.00	5.00	171	1.26	1.45	.00	5.00	
3-mth	181	.88	1.06	1.00	4.00	165	1.43	1.48	.00	5.00	
Appearance conversations											
Pre-test	187	2.00	.98	1.00	5.00	197	2.39	1.04	1.00	5.00	-3.76(382), p < .01
Post	178	2.07	.97	1.00	5.00	168	2.37	1.09	1.00	5.00	
3-mth	181	1.97	.99	1.00	5.00	165	2.30	1.06	1.00	5.00	
Dietary restraint											
Pre-test	187	2.15	1.0	1.00	5.00	195	2.31	1.08	1.00	5.00	-1.52(380), p = .12
Post	178	2.05	.99	1.00	5.00	165	2.17	1.06	1.00	5.00	
3-mth	181	1.90	.87	1.00	4.80	165	2.21	1.11	1.00	5.00	
Perceived sociocultural pressure											
Pre-test	187	1.91	.86	1.00	4.50	200	2.22	1.04	1.00	4.83	-3.22(379.5), p < .01
Post	178	1.99	.91	1.00	4.75	168	2.07	1.02	1.00	4.67	
3-mth	181	1.76	.81	1.00	5.00	165	2.01	1.01	1.00	5.00	
Negative affect											
Pre-test	187	2.16	.80	1.00	4.70	196	2.14	.79	1.00	4.80	.24(381), p = .80
Post	178	2.18	.78	1.00	4.50	167	2.05	.83	1.00	4.60	
3-mth	181	2.24	.78	1.00	5.00	165	2.09	.81	1.00	4.30	
Life engagement											
Pre-test	187	1.31	.45	1.00	3.20	195	1.48	.55	1.00	3.60	-3.33(372.1), p < .01
Post	178	1.33	.52	1.00	3.30	165	1.44	.61	1.00	4.00	
3-mth	181	1.25	.46	1.00	3.60	165	1.37	.55	1.00	3.90	
Future plans											
Pre-test	186	4.36	.66	1.57	5.00	192	4.32	.70	1.57	5.00	.44(376), p = .65
Post	176	4.34	.76	1.57	5.00	163	4.38	.68	1.57	5.00	
3-mth	181	4.29	.75	1.57	5.00	165	4.33	.75	1.57	5.00	

2.2.5. Intervention effects on outcome measures

2.2.5.1. Time by Group interactions. As shown in Table 4, there was a significant Time by Group interaction for social comparison and perceived sociocultural pressure. Compared to the comparison group, students in the intervention group reported significantly

greater levels of sociocultural pressure at post-test compared to pre-test ($d = .30$). Further, compared to the intervention group, the comparison group showed a significantly greater reduction in social comparison at 3-month follow-up compared to pre-test ($d = .20$). The change from pre-test to post-test, as well as from pre-test to 3-

Table 4
Effects of Group on internalization, social comparison and sociocultural pressure across Time.

Predictors	Internalization			Social comparison			Sociocultural pressure		
	β	SE	p	β	SE	p	β	SE	p
Intercept	2.99	.07	< .001	1.64	.01	< .001	1.45	.02	< .001
Group (Intervention) ^a	-.22	.11	< .05	-.11	.02	< .001	-.10	.03	< .05
Time (Post) ^b	-.13	.06	< .05	-.04	.01	< .05	-.04	.02	< .05
Time (Follow-up) ^b	-.25	.06	< .001	-.08	.01	< .001	-.06	.02	< .001
Group x Time (Intervention x Post) ^{ab}	-.04	.09	.663	.04	.02	.082	.07	.02	< .05
Group x Time (Intervention x Follow-up) ^{ab}	.05	.09	.546	.06	.02	< .05	.01	.02	.636
Random effect for intercept (Variance)	.90	.07		.05	.01		.07	.01	

month follow-up, for the remaining variables (self-esteem, body-esteem, body appreciation, future plans, negative affect, appearance-based teasing frequency/impact and dietary restraint), did not significantly differ between the intervention and comparison groups.

2.2.5.2. Time effects. Across Time, there were significant changes from pre-test to post-test, as well as pre-test to 3-month follow-up, for self-esteem, body-esteem, body appreciation, internalization, sociocultural pressure, social comparison, and dietary restraint. Specifically, self-esteem, body-esteem and body appreciation were greater at post-test compared to pre-test for both the intervention and comparison groups. Further, internalization, sociocultural pressure, social comparison, and dietary restraint were significantly lower at post-test compared to pre-test for both groups. Compared to pre-test, at the 3-month follow up, self-esteem, body-esteem and body appreciation were significantly greater across both the intervention and comparison group, while internalization, sociocultural pressure, social comparison, dietary restraint and barriers to life engagement were significantly lower at the 3-month follow-up compared to pre-test across both groups.

2.2.5.3. Group effects. Across Group, there was no significant change across Group for the body image or self-esteem outcome variables.

2.3. Study 1: Discussion

This study presented an independent replication and evaluation of *Dove Confident Me*, a globally distributed universal classroom-based body image program developed for co-educational populations. Overall, the findings did not support the hypotheses. While there were significant intervention effects for social comparison and perceived sociocultural pressure, these findings were in the opposite direction to that hypothesized. Participants in the intervention group reported significantly less reduction in perceived sociocultural pressure at post-test, compared to the comparison group. A similar result was reported by Wilksch et al. (2015) and Diedrichs et al. (2015) using the same scale, and akin to the current study, Diedrichs et al. (2015) effect sizes were small with the finding not maintained at follow-up. The researchers suggested that the perceived sociocultural pressure scale was in fact measuring an awareness of sociocultural pressures, rather than feelings of distress (Diedrichs et al., 2015). Thus, the current finding may be a result of increased participant awareness of sociocultural pressures due to DCM's focus on teaching students to recognize these appearance-based pressures. Further, although controlled for during the analysis, the comparison group had significantly greater socio-cultural pressure at baseline compared to the intervention group, and as such, there may have been more room for these scores to move in the comparison group.

The significant reduction in social comparison at both post-test and 3-month follow-up for the comparison group compared to the intervention group is of interest. Closer examination reveals that this was likely due to a decrease in social comparison in the comparison group rather than a significant increase in overall levels of social comparison in the intervention group. In fact, both groups demonstrated a significant decrease in social comparison across time, yet the comparison group had significantly greater levels at baseline compared to the intervention group, suggesting there was likely more capacity for reduction in the comparison group compared to the intervention group.

Results revealed that self-esteem, body-esteem, and body appreciation were significantly greater across both groups, while internalization of the thin-ideal, perceived sociocultural pressure, social comparison, dietary restraint, and barriers to life engagement, were significantly less across both groups, following the intervention. Although improvements in both intervention and comparison

group are not an uncommon trend in research (Baranowski & Hetherington, 2001; McVey, Lieberman, Voorberg, Wardrope, & Blackmore, 2003; Smolak & Levine, 2001; Smolak et al., 1998a, 1998b), the current findings are somewhat inconsistent with initial research trials reporting improved body esteem post-test (Diedrichs et al., 2015; Diedrichs et al., 2020; Garbett et al., 2021; Torres et al., 2018). The positive improvements in body esteem in previous trials had relatively small effect sizes, so it may be that the current study did not have the statistical power to detect effects in this smaller, unfunded replication. The findings might be explained by many participants scoring within the normal range on several measures at baseline and consequently, having little scope to improve their scores, which is not uncommon in prevention research when using a selective or universal population (Schwartz et al., 2019; Torres et al., 2021; Watson et al., 2016). Further, participants in the current study had a mean age of 13.3 years, one to two years older than participants used in the initial trials (Diedrichs et al., 2020; Garbett et al., 2012; Torres et al., 2018). When delivering school-based universal interventions, a focus on younger students 12–13-years has been suggested (Yager et al., 2013). Thus, the failure to provide consistent results with previous evaluations may indicate that the DCM program is more suitable for younger students. Support for this is evident in the null findings reported by Atkinson et al. (2021) when examining DCM with 13–14-year-old students. Further, Wilksch et al. (2015) reported a similar outcome in their trial of a modified HBM intervention and suggested that their failure to produce consistent results with the previous evaluations might have been due to using an older sample of participants. Given there is evidence to suggest a stable trajectory of body dissatisfaction and body esteem from mid-adolescence to adulthood, it suggests that the critical period for malleability, or intervention and prevention, may be prior to the age of 11 years (Lacroix et al., 2023).

Despite outcomes not supporting the hypotheses, the findings add to the expanding field of research involving teacher-led delivery of school-based body image programs. Eighty-five percent of teacher feedback indicated they felt confident delivering the intervention and 71 % agreed they would teach it again. However, 28 % of teachers disagreed that the program was engaging for students. Participant acceptability of the DCM program was mixed with students rating high comfort and teacher effectiveness, and low-moderate importance, enjoyment, and helpfulness. Participants in previous trials (Diedrichs et al., 2020; Garbett et al., 2021) rated DCM moderate to high regarding enjoyment, effectiveness, and importance, whereas participants in the current study rated these as low to moderate. Given these findings, teachers at the school requested that revisions be made to program materials prior to subsequent delivery of the program, which forms Study 2.

3. Study 2- Replication of modified DCM program

The findings obtained in the initial replication indicated minimal improvement in body image outcomes following participation in the universal classroom-based body image program *Dove Confident Me* (DCM) in girls attending an independent private girls' school in Australia. Thus, slight modifications were made to DCM to better suit the students in the school where the study was conducted, similar to the Garbett et al. (2021) replication study where the researchers made cultural adaptations for the Indian audience. By modifying the DCM program, the current study further acknowledges the way schools are likely to use globally disseminated classroom-based programs, and reflects the expertise of teachers in differentiating curriculum and programs to suit the needs of the students in their class.

The major objective of the current study was therefore to examine the acceptability and effectiveness of a modified version of DCM within the real life setting of an Australian single-sex girl's

school. It was hypothesised that participation in the modified DCM would result in significant improvements in body esteem, body satisfaction and self-esteem, alongside a significant decrease in internalization of the thin-ideal, perceived sociocultural pressure, social comparison, appearance conversations, dietary restraint and perceived maternal pressure compared to a comparison group. Further, it is hypothesized that these outcomes will be maintained at the 3-month follow-up. Finally, it is hypothesized that students participating in the modified version of DCM will report increased ratings of enjoyment, helpfulness, comfortableness, and importance of the program compared to that reported in Study 1.

3.1. Study 2: method

Study 2 was conducted in 2018 at the same independent girls' school as the initial replication and adopted the same methodological approach. Several measures were changed, the intervention took place earlier in the school year, and the comparison group comprised of students attending two schools not involved in the previous study.

3.1.1. Participants

A total of 596 (intervention = 242, comparison = 354) girls aged between 11 and 14 years with a mean age of 12.8-years ($SD = .39$) were recruited into the study. Sixty-three students (intervention = 9, comparison = 54) were assumed absent from school on the day of pre-test data collection as these students completed the subsequent data collection measures. Most students spoke English at home (86.1%). The intervention group had significantly more participants born in Australia compared to the comparison group $t(418) = 2.47, p = .01$, and significantly more participants in the comparison group spoke languages other than English at home compared to the intervention group $t(445) = -2.29, p = .02$. See Fig. 2.

3.1.2. Data collection

Data were collected via a similar process to that outlined in Study 1. No students opted out of the project prior to data collection, thus research questionnaires were provided to all students at the intervention and comparison schools. The pre-test survey was administered the week prior to the intervention commencing (April 2018) and links to the post-test and 3-month follow-up surveys were sent to participants immediately post (June 2018), and 3-months after (September 2018), the completion of DCM at the intervention school.

3.1.3. Measures

The same measures used in Study 1 were utilized for Study 2 with some modifications. See Appendix one for details of the measures used and Cronbach's alphas for the sample in Study 2. To reduce the overall length of the survey, scales measuring life engagement, future plans, appearance-based teasing and negative affect were removed. The measure for internalization of the thin-ideal was changed from the *Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ)* (Thompson et al., 2004) to the *Ideal Body Stereotype Scale (IBSS)* (Stice, Ziemba, Margolis, & Flick, 1996). While both measures have been used interchangeably to assess thin-ideal internalization, the IBSS is thought to capture a less personalized desire for thinness and instead focuses on the awareness of sociocultural ideals (Thompson, Schaefer, & Dedrick, 2018). Given the changes in media consumption, it was felt that the sample would not relate as well to the inclusion of questions referencing TV, magazines, and movies. As the study also included a complementary intervention for mothers delivered alongside the DCM (reported elsewhere), the *Maternal Pressure Scale* (Corning, Gondoli, Bucchianeri, & Blodgett Salafia, 2010) was added.

3.1.4. Program implementation

Delivery of the program moved from the end of the school year (Term 4- Sept- Nov) to earlier in the year (Term 2- April- June). Therefore, participants were six months younger than the previous study and evidence suggests that classroom-based programs for body image are more effective when delivered to younger participants (Paxton, 1993; Wilksch, 2014; Yager et al., 2013). The modified DCM intervention was delivered by nine separate teachers who had experience delivering the DCM previously. Teachers were provided with one hour of training highlighting modifications to the program. The comparison group participated in their usual wellbeing lessons which did not include any body image content during the research period (Table 5–8).

3.1.4.1. Modification of the program. Slight modifications were made to the DCM content to amend the program for the Australian all-girls context. Modification included replacing several activity worksheets with class discussion, removing the video relating to a boy's locker room conversation, and including two Australian videos. Details of the modifications are provided in Table 9.

3.1.5. Data and power analysis

Data screening, preparation and analysis were conducted as outlined in Study 1. Of the dependent variables, self-esteem, body-esteem and internalization of thin-ideal were normally distributed. The remaining variables were positively skewed, with the exception of body appreciation, which was negatively skewed, thus square root transformations were applied to positively skewed variables and a reflect and square root transformation as applied to body appreciation to improve normality (Pallant, 2016). An analysis of intervention effects was conducted on both the transformed and untransformed data. As there were no differences in the results, findings are presented using transformed data. A power analysis was conducted as outlined in Study 1 and suggested that the study was slightly underpowered to detect small effects, but well powered to detect moderate effects (Cohen's $d = .5, n = 47$).

3.2. Study 2 Results

3.2.1. Preliminary analysis

Missing data at post-test were 22.3% ($n = 70$) at post-test and, 21.6% ($n = 66$) at the 3-month follow-up. Missing data were examined using Little's Missing Completely at Random test (MCAR; Little, 1988) and results indicated that the data were missing completely at random, $\chi^2(489) = 508.62, p = .260$. Attendance at DCM was good with 93% of students in the intervention group indicating they attended each four sessions of the modified DCM program.

3.2.2. Program acceptability

Intervention participants ($n = 196$) rated the modified DCM program high acceptability for comfort ($M = 3.23, SD = 1.21$), importance ($M = 3.35, SD = 1.31$), and teacher effectiveness ($M = 3.71, SD = 1.21$), and moderate acceptability regarding enjoyment ($M = 2.67, SD = 1.12$) and helpfulness ($M = 2.19, SD = 1.09$). When comparing the student acceptability ratings between the 2016 and 2018 replications, a series of independent groups t-tests found significant differences on all measures of acceptability except for comfortableness. Specifically, the students participating in the current study rated significantly higher acceptability of the modified DCM program regarding enjoyment, helpfulness, teacher effectiveness and importance. Results for the independent groups t-tests are included in Table 10.

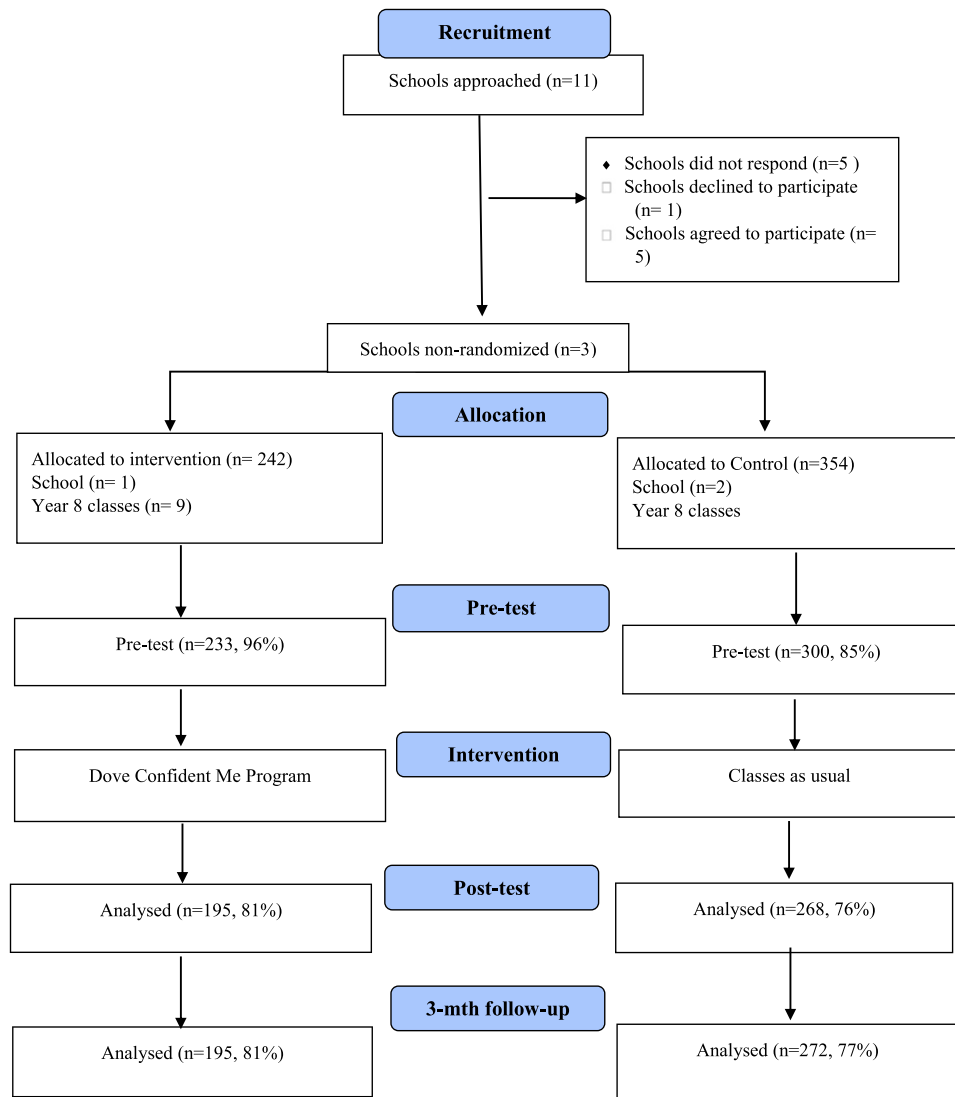


Fig. 2. Study 2: CONSORT diagram of recruitment and data collection.

Table 5
Effects of Group on body image and self-esteem outcomes across Time.

Predictors	Self-esteem			Body-esteem			Body appreciation		
	β	SE	p	β	SE	P	β	SE	p
Intercept	2.71	.04	<.001	3.13	.06	<.001	3.49	.06	<.001
Group (Intervention) ^a	.05	.06	.397	.16	.08	.067	.10	.08	.223
Time (Post) ^b	.11	.03	<.05	.12	.04	<.05	.11	.05	<.05
Time (Follow-up) ^b	.10	.03	<.05	.17	.04	<.001	.12	.05	<.05
Group x Time (Intervention x Post) ^{ab}	-.05	.04	.242	-.08	.06	.160	-.09	.07	.185
Group x Time (Intervention x Follow-up) ^{ab}	.01	.05	.946	-.02	.06	.672	-.06	.07	.369
Random effect for intercept (Variance)	.25	.02		.62	.04		.52	.04	

Note: Reference category ^a = Comparison, Reference category ^b = Pre-Test

3.2.3. Fidelity

Except for Session 4 (55%) there was a high rate of fidelity checklist return (90–100%) from teachers. Teachers indicated that they delivered most of the content in each session.

3.2.4. Baseline comparison of scores

Table 11 outlines descriptive statistics for each measure at baseline, post-test and 3-month follow-up for the intervention and comparison groups. A series of independent groups t-tests found no significant differences on pre-test measures except for social

comparison and appearance conversation. The intervention group reported significantly less social comparison ($d=.22$) and appearance conversation ($d=.25$) at baseline compared to the comparison group. These findings were controlled for during subsequent analysis.

3.2.5. Intervention effects on outcome measures

3.2.5.1. Time by Group interactions. As shown in Table 12, there was a significant Time by Group interaction for internalization of the thin-ideal and perceived sociocultural pressure. Compared to the comparison group, students in the intervention group reported

Table 6
Effects of Group on appearance talk, teasing frequency and teasing impact across Time.

Predictors	Appearance talk			Teasing-Frequency			Teasing-Impact		
	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>
Intercept	1.51	.02	<.001	.16	.01	<.001	.25	.02	<.001
Group (Intervention) ^a	-.13	.03	<.001	-.03	.02	.079	-.06	.03	.088
Time (Post) ^b	-.01	.02	.790	-.01	.01	.291	-.02	.03	.557
Time (Follow-up) ^b	-.01	.02	.400	-.02	.01	.083	-.01	.03	.599
Group x Time (Intervention x Post) ^{ab}	.02	.03	.388	.01	.02	.386	.06	.04	.106
Group x Time (Intervention x Follow-up) ^{ab}	.00	.03	.909	-.00	.02	.758	-.06	.04	.130
Random effect for intercept (Variance)	.07	.01		.02	.01		.03	.01	

Table 7
Effects of Group on negative affect, life engagement and future plans.

Predictors	Negative affect			Life engagement			Future plans		
	β	SE	<i>p</i>	β	SE	<i>p</i>	β	SE	<i>p</i>
Intercept	1.44	.02	<.001	1.20	.01	<.001	.19	.01	<.001
Group (Intervention) ^a	.01	.02	.826	-.06	.02	<.001	-.01	.02	.817
Time (Post) ^b	-.03	.02	.079	-.01	.01	.252	-.01	.01	.545
Time (Follow-up) ^b	-.01	.02	.407	-.04	.01	<.001	-.01	.01	.666
Group x Time (Intervention x Post) ^{ab}	.03	.02	.180	.02	.02	.311	.01	.02	.934
Group x Time (Intervention x Follow-up) ^{ab}	.04	.02	.083	.02	.02	.297	.02	.02	.390
Random effect for intercept (Variance)	.05	.01		.03	.01		.02	.01	

Table 8
Effects of Group on dietary restraint across Time.

Predictors	Dietary restraint		
	β	SE	<i>p</i>
Intercept	1.49	.02	<.001
Group (Intervention) ^a	-.06	.03	.067
Time (Post) ^b	-.04	.02	<.05
Time (Follow-up) ^b	-.05	.02	<.05
Group x Time (Intervention x Post) ^{ab}	.01	.02	.709
Group x Time (Intervention x Follow-up) ^{ab}	-.02	.02	.391
Random effect for intercept (Variance)	.07	.01	

Note: Reference category^a = Control, Reference category^b = Pre-Test

significantly greater levels of internalization of the thin-ideal at both post-test ($d = .20$) and 3-month follow-up ($d = .20$) compared to pre-test. Secondly, compared to the comparison group, students in the intervention group reported significantly greater levels of sociocultural pressure at post-test compared to pre-test ($d = .30$). For the remaining variables (self-esteem, body-esteem, body appreciation, social comparison, appearance talk, maternal pressure, and dietary restraint), the change from pre-test to post-test, as well as from pre-test to 3-month follow-up, did not significantly differ between the intervention and comparison groups.

3.2.5.2. Time effects. Across Time, there were significant changes for self-esteem, body appreciation, sociocultural pressure, and dietary restraint. Specifically, self-esteem was significantly greater at post-test compared to pre-test irrespective of group. Body appreciation was significantly lower at 3-month follow up compared to pre-test, sociocultural pressure was significantly less at post-test compared to pre-test and dietary restraint was significantly less at both post-test and 3-month follow-up compared to pre-test, across both groups.

3.2.5.3. Group effects. Across Group, there were no significant differences except for social comparison and appearance talk. At baseline, the intervention group reported significantly less social comparison and less appearance talk compared to the control group.

3.3. Study 2 discussion

This study examined the effectiveness and acceptability of a modified DCM program with a sample of Grade 8 girls attending a single-sex Australian private school. The results revealed significant intervention effects for sociocultural pressure and internalization of the thin-ideal, but in the opposite direction to that hypothesized. These findings are consistent with what was found in Study 1, and what has been previously reported in the literature (Diedrichs et al., 2015; Wilksch et al., 2015). This has been suggested to highlight the focus of the DCM program in increasing participant’s ability to recognize certain sociocultural pressures (Diedrichs et al., 2015). The intervention group’s significant increase in internalization of thin-ideal is inconsistent with the initial replication and previous research trials, and inconsistent with comparable research using the IBSS measure (Stice et al., 2003b). According to Thompson et al. (2018), the questions comprising the IBSS capture a less personalized desire for thinness and instead focus on the awareness of socio-cultural ideals. Thus, this finding may also highlight enhanced participant awareness of sociocultural ideas due to DCM’s focus on teaching students to recognize these appearance-based pressures. Close examination of the means in terms of body esteem, body satisfaction and self-esteem variables indicate that each one increased within the intervention group at both post-test and 3-month follow-up. Thus, there was no evidence that the intervention resulted in harm (Sharpe et al., 2013). However, given past concerns over iatrogenic effects in school-based eating disorder prevention programs (Carter, Stewart, & Fairburn, 1998; Cohn & Maine, 1998; Mann & Burgard, 1998), it might be possible that approaches to universal body image programs require reconsideration and reformation to come from a salutogenic, positive body image approach. In particular, it might be necessary to move on deliberate teaching about the existence of ‘appearance ideals’, as this may unintentionally introduce or reinforce the existence of ‘ideals’ that increases awareness and internalization of sociocultural pressures among those who might not have been aware of them before.

An examination of the acceptability of the modified DCM program revealed significantly higher acceptability ratings compared to the initial replication in terms of the enjoyment of, perceived efficacy of, and importance of the program, and in terms of how well teachers taught the program. While there was an improvement in

Table 9
Modifications to Dove Confident Me: 5 Session Program.

Session	Original DCM Content	Modified DCM Content	Reason for Modification
Session 1 Appearance Ideals	Nature and consequences of appearance ideals <ul style="list-style-type: none"> • What are appearance ideals?- Activity sheet • How are appearance ideals changing?- Video • Can we match appearance ideals? • Where do we learn about appearance ideals? • What appearance related pressures do we face – think, pair share & Activity sheet • What is the impact of these appearance pressures? – Class discussion • What else can we value? – Activity sheet 	Nature and consequences of appearance ideals <ul style="list-style-type: none"> • What are appearance ideals?- Activity sheet • How are appearance ideals changing -Pictures • Can we match appearance ideals? • Where do we learn about appearance ideals? • What appearance related pressures do we face – think, pair share & Activity sheet • What is the impact of these appearance pressures? – Class discussion • What else can we value? -Class discussion 	<ul style="list-style-type: none"> • Pictures were substituted for the animated video to illustrate appearance ideals and pictures facilitated more interaction among the students, they also included cultural appearance ideals. • Class discussions replaced activity sheets as feedback from Study 1 indicated that students preferred class discussions rather than completion of worksheets.
Session 2 Media Messages	Media literacy <ul style="list-style-type: none"> • What do we mean by media? • How can images be manipulated? - Video & Activity sheet • Why is media created this way?- Class discussion • How would it feel to have your image manipulated? • What is the impact of media messages – Video • Can you decode media messages? - Activity sheet • What is the influence of social media? • How can we remix our response to the media? 	Media literacy <ul style="list-style-type: none"> • What do we mean by media? • How can images be manipulated? – Video & Class discussion • Why is media created this way?- Class discussion • How would it feel to have your image manipulated? • What is the impact of media messages – Video • Can you decode media messages? – Class discussion and Extension Activity Sheet - decode a media advertisement. • Be Real, Get Real videos • What is the impact of social media? • How can we remix our response to the media? 	<ul style="list-style-type: none"> • Class discussions replaced activity sheets for the same reason outlined above. • The two-part <i>Be Real, Get Real</i> video was included as they involved Australian adolescents and discussed media manipulation, promotion of the appearance ideal, the influence of the media, how it makes you feel, and how adolescents can challenge the fake images they see on social media.
Session 3 Confront Comparisons	Appearance-related social comparisons <ul style="list-style-type: none"> • What ideals are portrayed by the media? • How do we compare ourselves to people around us?- Video & Class discussion • How do we compare our looks? • What happens when people compare their looks? – Activity sheet • What is the impact of these comparisons? – Activity sheet • The whirlpool of comparison • What can we do instead? • Can you catch yourself?- Role play • How will you change your script? - Activity sheet • Be a champion for change 	Appearance-related social comparisons <ul style="list-style-type: none"> • What ideals are portrayed by the media? • How do we compare ourselves to people around us?- Video & Class discussion • How do we compare our looks? • What happens when people compare their looks? – Class discussion • What is the impact of these comparisons? – Class discussion • The whirlpool of comparison • What can we do instead? • Can you catch yourself?- Role play • How will you change your script? - Class discussion • Be a champion for change 	<ul style="list-style-type: none"> • Class discussions replaced activity sheets for the same reason outlined above.
Session 4 Banish Body Talk	Appearance-based conversations and teasing <ul style="list-style-type: none"> • How do we talk about appearance? – Class discussion • What is body talk? • How do we use body talk?- Videos, Activity sheet & Class discussion. • Conversations with Friends • Conversations with the Team • Conversations with the mirror • What is the impact of body talk? - Video • How can we challenge body talk?- Role play • Be a champion for change 	Appearance-based conversations and teasing <ul style="list-style-type: none"> • How do we talk about appearance? – Class discussion • What is body talk? • How do we use body talk?- Videos, Activity sheet & Class discussion. • Conversations with Friends • Conversations with the Team Conversations on social media - Instagram and body talk • Conversations with the mirror • What is the impact of body talk?- Video • How can we challenge body talk?- Role play • Be a champion for change 	<ul style="list-style-type: none"> • Session 4 and 5 were combined and shortened due to limited time available in timetable • Class discussions replaced activity sheets for the same reason outlined above. • Replaced the <i>Conversations with the Team</i> (boys locker room) video with a discussion about <i>Conversations on Instagram</i> as this was a more relevant situation for the students. • Turia Pitt video replaced the <i>Champion for Change</i> videos as it was thought she would resonate more with the students.
Session 5 Be The Change	Body Activism <ul style="list-style-type: none"> • How can we celebrate individuality? – Activity sheet • Be a body confidence champion- Activity sheet • Champion change in our world- Video • How can we change our world?- Activity sheet • Take action together 	Body Activism <ul style="list-style-type: none"> • How can we celebrate individuality?—Activity sheet • Be a body confidence champion- Class discussion • Champion change in our world- Turia Pitt Video • How can we change our world?- Class discussion • Take action together- Brief class discussion	

Note: Additional/substituted content highlighted in blue.

student ratings of how comfortable they felt when taking part in the program, it was not statistically significant. The current acceptability ratings were comparable to those from participants in [Diedrichs et al. \(2020\)](#) and [Garbett et al. \(2021\)](#), suggesting that the modified program was a better fit for the selective group of Australian school girls.

Given both the single session and 5-session trials of DCM reported positive outcomes ([Diedrichs et al., 2020](#); [Diedrichs et al., 2015](#); [Garbett et al., 2021](#)), the null findings of the current study are concerning. Baseline measurements revealed that intervention participants had significantly less social comparison and appearance-based talk compared to the comparison group, and a number of

Table 10
Comparisons between Study 1 and Study 2 student acceptability ratings, including means, standard deviation and T-test comparisons.

	2016 replication			2018 modified replication			<i>t</i> (df) <i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	
How much did you enjoy these lessons?	181	2.22	1.12	196	2.67	1.14	3.93(375), <i>p</i> < .01
How much did the lessons help you to feel better about yourself?	181	1.90	1.13	196	2.19	1.09	2.50(375), <i>p</i> < .01
How comfortable did you feel taking part?	181	3.15	1.41	196	3.23	1.20	0.59(375), <i>p</i> = .55
How well were the lessons taught by your teacher?	181	3.10	1.39	196	3.71	1.20	4.50(375), <i>p</i> < .01
How important do you think it is for young people to take part in lessons like these?	181	2.91	1.41	196	3.35	1.31	3.09(375), <i>p</i> < .01

Table 11
Means, standard deviation, minimum and maximum of outcome variables by Time and Group.

Intervention	Comparison					<i>t</i> (df) <i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	
Self esteem						
Pre-test	233	2.72	.62	1.33	4.00	-1.65(530), <i>p</i> = .09
Post-test	195	2.81	.67	1.17	4.00	
3- month	195	2.79	.67	1.33	4.00	
Body esteem						
Pre-test	233	3.40	.89	1.00	5.00	-.23(530), <i>p</i> = .81
Post-test	195	3.52	.85	1.44	5.00	
3- month	192	3.45	.91	1.00	5.00	
Body appreciation						
Pre-test	231	3.76	.77	1.63	5.00	-.03(528), <i>p</i> = .96
Post-test	195	3.72	.87	1.50	5.00	
3- month	191	3.64	.88	1.50	5.00	
Internalization						
Pre-test	230	2.80	.89	1.00	4.83	-.68(524), <i>p</i> = .49
Post-test	195	2.86	.90	1.00	5.00	
3- month	191	2.89	.93	1.00	5.00	
Maternal pressure						
Pre-test	232	1.72	.53	1.00	3.11	.26(528), <i>p</i> = .53
Post-test	195	1.75	.58	1.00	3.44	
3- month	192	1.76	.63	1.00	4.00	
Social comparison						
Pre-test	230	2.23	.78	1.00	4.67	-2.76(525), <i>p</i> < .01
Post-test	195	2.26	.76	1.00	4.33	
3- month	191	2.29	.93	1.00	5.00	
Appearance conversations						
Pre-test	230	1.87	.92	1.00	5.00	-3.02(524), <i>p</i> < .01
Post-test	195	1.88	.87	1.00	4.80	
3- month	190	1.97	1.02	1.00	5.00	
Dietary restraint						
Pre-test	229	2.16	.94	1.00	4.90	-1.64(522), <i>p</i> = .10
Post-test	195	2.08	.91	1.00	4.70	
3- month	189	2.08	.95	1.00	5.00	
Sociocultural pressure						
Pre-test	229	1.85	.83	1.00	5.00	-1.38(521), <i>p</i> = .16
Post-test	195	1.85	.77	1.00	4.50	
3- month	188	1.91	1.00	1.00	5.00	

participants appeared to score within normal range at baseline on several measures, thus one explanation for the null results could be that participants had little scope to further improve their scores. While the current sample was selective, the finding supports evidence that universal programs are more effective when participants have higher baseline levels of pathology than for the overall sample (Stice et al., 2007; Wilksch, 2014). A second explanation might be that while the acceptability of the program was strengthened, modifying the DCM program could have contributed to the null findings. It is possible that the removal of worksheets, the shortening and combining of Session 4 and 5, and substitution of Australian videos, may have weakened the effectiveness of the program. The worksheets may have ensured increased fidelity to manual content instead of the class potentially becoming sidetracked with discussion. Finally, the findings may suggest that DCM, both in the original and modified form, is not effective in improving body image

or reducing eating disorder risk factor outcomes in a selective population of Australian girls attending a single-sex school. It may be the case that girls require a more focused and detailed intervention that addresses the specific experience of body image from a female perspective in order to be more effective in this context. As such, attempts to develop one universal intervention, effective for worldwide delivery, might prove too ambitious. The present study raises the possibility that several programs are required, to suit both universal and selective audiences, as well as co-educational and single-sex populations, across the three key age groups in secondary school (12–13, 14–15, and 16–18-years).

The current study has multiple strengths including the modified replication was the third time teachers had delivered DCM to students. Commonly, research using endogenous providers involves evaluating their first delivery of an intervention program. Thus, the level of experience, confidence and competence teachers held

Table 12
Effects of Group on self-esteem, body esteem and body appreciation across Time.

Predictors	Self-esteem			Body-esteem			Body appreciation		
	β	SE	p	β	SE	p	β	SE	p
Intercept	2.81	.03	< .001	3.44	.05	< .001	.31	.01	< .001
Group (Intervention) ^a	-.09	.05	.092	-.04	.07	.582	.01	.01	.310
Time (Post) ^b	.070	.03	< .05	.017	.03	.606	.01	.01	.799
Time (Follow-up) ^b	.049	.03	.103	-.03	.03	.220	.02	.01	< .001
Group x Time (Intervention x Post) ^{ab}	.01	.04	.955	.06	.04	.180	.01	.01	.877
Group x Time Intervention t x Follow-up) ^{ab}	.01	.04	.776	.04	.04	.310	-.01	.01	.636
Random effect for intercept (Variance)	.32	.02		.71	.04		.02	.01	

Table 13
Effects of Group on social comparison, sociocultural pressure and internalization across Time.

Predictors	Social comparison			Sociocultural Pressure			Internalization		
	β	SE	p	β	SE	p	β	SE	p
Intercept	1.53	.01	< .001	1.36	.01	< .001	2.82	.050	< .001
Group (Intervention) ^a	-.05	.02	< .05	-.03	.02	.226	-.05	.07	.513
Time (Post) ^b	-.02	.01	.120	-.03	.01	< .05	-.09	.04	.062
Time (Follow-up) ^b	.01	.01	.795	-.01	.01	.269	-.06	.04	.201
Group x Time (Intervention x Post) ^{ab}	.03	.01	.062	.04	.02	< .05	.16	.07	< .05
Group x Time (Intervention x Follow-up) ^{ab}	.01	.01	.548	.04	.02	.051	.14	.07	< .05
Random effect for intercept (Variance)	.05	.01		.07	.01		.51	.03	

Table 14
Effects of Group on appearance talk, dietary restraint and maternal pressure across Time.

Predictors	Appearance talk			Dietary restraint			Maternal Pressure		
	β	SE	p	β	SE	p	β	SE	p
Intercept	1.41	.01	< .001	1.47	.017	< .001	1.27	.01	< .001
Group (Intervention t) ^a	-.07	.02	< .05	-.03	.02	.202	.03	.01	.066
Time (Post) ^b	-.02	.01	.095	-.03	.01	< .05	.01	.01	.695
Time (Follow-up) ^b	-.01	.01	.619	-.02	.01	< .05	-.01	.01	.936
Group x Time (Intervention x Post) ^{ab}	.04	.02	.104	.01	.01	.513	-.01	.01	.830
Group x Time (Intervention x Follow-up) ^{ab}	.04	.02	.063	.01	.01	.508	.01	.01	.368
Random effect for intercept (Variance)	.07	.01		.07	.01		.03	.01	

Note: Reference category^a = Control, Reference category^b = Pre-Test

regarding the DCM resource highlights a unique strength. The fact that the researcher was based at the intervention school provided unique insights throughout this study to the complexities of marrying research recommendations with real-life restrictions. However, several limitations must be acknowledged. Firstly, with respect to program delivery, it was not possible to comprehensively evaluate teacher adherence to program content as fidelity measures relied on teacher report rather than researcher observation and assessment. The delivery of the program may have been hampered by fortnightly lessons instead of weekly and the restriction of only having four sessions available, instead of the prescribed five. While this is illustrative of conducting research in real-life settings (Atkinson et al., 2021), it does add a limitation to conducting an independent replication of the effectiveness of DCM. Finally, while the study was well powered to detect medium effects, it was slightly underpowered to detect small effects and the follow-up measures were restricted to 3-months (Tables 13 and 14).

4. Recommendations and conclusions

The study provided insight into the reality of how school personnel typically engage with globally disseminated intervention programs. Due to both real-life constraints and the embedded teaching practice of differentiating curriculum to suit students, strict adherence to manualized programs within the school setting may be challenging. Teachers and school staff are likely to modify programs to suit the needs and interests of their students, the context of the

school, and the relevant issues and cultural conversations of the time. As such, it is recommended that future researchers consider developing multiple interventions, or malleable interventions that can readily be adapted to suit diverse populations regarding age, gender or culture. The high acceptability ratings observed in Study 2 for the modified version of DCM suggest that while researchers are experts in etiological theory, school personnel are experts regarding their students and school community. Increased collaboration between researchers and school personnel when developing or modifying intervention programs, may be one way of preventing this. To ensure that interventions are flexible enough to endure malleability in both content and design, while robust enough to sustain effectiveness, increased collaboration between researchers and school personnel is recommended.

It might be the case that there is a need to move towards programs that take a positive body image approach rather than targeting eating disorder risk factors. A positive body image approach supports contemporary approaches within the field of women's body image interventions and third wave therapies (Alleva et al., 2015; Alleva et al., 2018; Albertson et al., 2014; Mulgrew et al., 2017; Guest et al., 2019). In fact, Torres (2021) recently suggested that DCM could be enhanced by focusing on positive body image, specifically, body awareness, body functionality and inner positivity. As body appreciation and body dissatisfaction are distinct constructs (Tylka & Wood-Barcalow, 2015b), it would be interesting to examine whether adolescent girls can experience both positive and negative body image simultaneously, as is thought the case for women (Bailey

et al., 2016; Tiggemann & McCourt, 2013; Tiggemann, 2015). Given the research suggesting body appreciation increases as a women age, while body dissatisfaction remains stable (Tiggemann & McCourt, 2013), the next direction for future research might involve identifying effective approaches, not only to reduce body dissatisfaction, but to promote body appreciation, in early adolescence.

While the results of these two studies suggest that both the original and modified DCM intervention did not effectively improve body image or reduce eating disorder risk factors in this selective population of Australian school girls, this study did provide support for task-shifting delivery to teachers, offered practical learnings relating to delivery and adaptation of widely disseminated programs, and suggested future directions with regards to utilizing universal interventions under diverse conditions. Such findings help us to understand the potential difficulties with traversing countries and cultures regarding wide-scale disseminated universal prevention programs- and suggest that one size may not fit all.

Declarations

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Appendix 1. Study 2: self-reported measures, and Cronbach's alpha for each scale

Outcome	Measures/Scales	Cronbach's alphas
Participant characteristics	Self-reported age, country of birth, language other than English spoken at home and ethnicity	
Body esteem	Body Esteem Scale for Adolescents & Adults (Mendelson et al., 2001), weight and appearance subscales combined, 18 items evaluating appearance and weight satisfaction (“I like what I look like in photos, I am happy with my weight”). Mean score, range 1–5 with negatively phrased items being reversed coded. Higher scores reflected greater body esteem.	.96
Body satisfaction	Body Appreciation Scale (Avalos et al., 2005). Version modified by Diedrichs et al. (2015), 8 items assessing body appreciation (“I feel good about my body”). Mean score, range 1–5. Higher scores reflected greater body appreciation.	.90
Internalization of appearance ideals	Added: Ideal-Body Stereotype Scale – Revised (IBSS-R; Stice et al., 1996) 8 items, mean score range 1–5.	.93
Sociocultural pressures	The Perceived Sociocultural Pressures scale , constructed by Diedrichs et al. (2015) and used in previous trials of DCM, was derived from the existing scales of sociocultural pressures (Stice & Bearman, 2001; Thompson et al., 2004). 12 items assessing perceived pressure to lose weight, change body shape, or change appearance, from mother/friends/media, and feelings related to the perceived pressure. Participants rated how much pressure they felt (“I’ve felt pressure to lose weight”), as well as how upset they felt by this pressure (“How upset are you by this pressure to lose weight?”). Mean score, range 1–5. Higher scores indicated greater perceived pressure and increased feeling of upset.	.93
Perceived maternal pressure	Added: Maternal Pressure Scale (Corning et al., 2010). 9 items, mean score range 1–4.	.79
Social comparisons	Social Comparison to Models and Peers Scale (Jones, 2001), 8 items, measuring comparisons about weight, body shape/build, face, and fashion sense/style to celebrities and people in the media, and peers (“How often do you compare your face to....”). Mean score, range 1–5. Higher scores reflecting greater social comparison.	.90
Appearance conversations	Appearance Conversations with Friends subscale of the culture among friends Appearance Conversation Scale (Jones et al., 2004) measuring frequency of appearance related talk. 5 items (“My friends and I talk about how our bodies look in clothes”). Mean score, range 1–5. Higher scores reflecting greater frequency of appearance related talk among peers.	.90
Self-esteem	Rosenberg Self-esteem Scale shortened (Neumark-Sztainer et al., 2007; Rosenberg, 1965), 6 items measuring participant’s self-esteem (“On the whole I am happy with myself”). Mean score, range 1–4. Negatively phrased items were reversed coded and higher averaged scores indicated greater self-esteem.	.82
Dietary restraint	Dutch Eating Behaviour Questionnaire , (van Strien et al., 1986), Restraint subscale, 10 items measuring dieting behaviours (“When you have put on weight do you eat less than usual?”). Mean score, range 1–5. Higher mean scores indicated higher levels of dietary restraint.	.94
Program acceptability	Purpose built measure used in the original study (Diedrichs et al., 2015; Diedrichs et al., 2020). 5 items measuring participants impressions of the DCM program at post-test. Students were asked to rate (1- not at all – 5- very much) their enjoyment of the sessions, how helpful, comfortable, and important the sessions were, and how well the program was taught. Mean score, range 1–5. Higher scores indicated feedback that is more positive. Participants were also offered an opportunity to provide written comments and suggestions regarding what they liked most about the lessons and what they liked the least about the lessons.	
Program attendance	Attendance at DCM sessions was measured via a self-report question on the post-test survey for intervention students. Participants were asked to indicate whether they did or did not attend each of the 4 sessions of DCM.	
Fidelity	As the DCM lessons were taught across 9 separate classes at the same time it was not possible to observe each teacher deliver the program. Thus, teacher fidelity to program content was measured via self-report. At the end of each session, teachers were asked to complete a checklist indicating the elements that they covered, in addition to providing any comments and feedback about the session.	

- Data Statement: At the time of ethical approval and informed consent, making data public was not expected, and therefore this was not approved or requested for this project. Anonymised datasets are available from the final author on request.
- Ethics Statement: Ethical Approvals were provided by the Victoria University Human Research Ethics Committee [HRE: 16–088].

CRedit authorship contribution statement

Jody Forbes: Conceptualisation, methodology, data collection, analysis, writing, project administration. **Susan Paxton:** Conceptualisation, methodology, supervision, revision of manuscript. **Zali Yager:** Conceptualisation, methodology, supervision, revision of manuscript.

Data Availability

Data will be made available on request.

Declaration of Competing Interest

The authors do not have current conflict of interest to disclose.

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