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Effectiveness of a peer-delivered dissonance-based program in reducing eating disorder risk
factors in high school girls

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PEER-LED EATING DISORDER RISK REDUCTION

Abstract

Objective: This pilot study investigated the feasibility, acceptability, and effectiveness of a peer-led dissonance-based eating disorders (ED) prevention/risk factor reduction program with high school girls. **Method:** Ninth grade girls ($n = 50$) received the peer-led program within the school curriculum. A quasi-experimental design was utilized to assess changes in ED risk factors pre- and post-intervention compared to waitlist control. Participants were followed through 3-month follow-up. **Results:** Peer-leader adherence to an intervention manual tailored for this age group was high. The intervention was rated as highly acceptable, with a large proportion of participants reporting that they enjoyed the program and learned and applied new information. Intervention participants exhibited significantly greater pre-post reductions in a majority of risk-factor outcomes compared to waitlist controls. When groups were combined to assess program effects over time there were significant pre-post reductions in a majority of outcomes that were sustained through 3-month follow-up. **Conclusions:** This pilot study provides tentative support for the effectiveness of using peer leaders to implement an empirically supported ED risk factor reduction program in a high school setting. Additional research is needed to replicate results in larger, better-controlled trials with longer follow-up.

Keywords: Eating disorders; risk factor reduction; cognitive dissonance; peer-leaders; high school

Effectiveness of a peer-delivered dissonance-based program in reducing eating disorder risk factors in high school girls

Dissonance-based interventions (DBIs) are clearly efficacious in reducing eating disorder (ED) risk factors among adolescent girls¹ and college-aged women²⁻⁶ and have been shown to reduce the onset of EDs over multi-year follow-up.⁷ DBIs challenge beliefs in the current beauty ideal through verbal, written, and behavioral “counterattitudinal” exercises to create cognitive dissonance⁸ and subsequent positive change in attitudes and behaviors.

Given DBIs’ efficacy, recent research has focused on dissemination. Many effectiveness trials use community providers to deliver interventions, which improves sustainability over time. DBIs can be effectively delivered using community providers with brief training, including high-school and college staff.⁹⁻¹² Given limitations on staff and time needed for training, selected groups (e.g., high-risk/highly body-dissatisfied females) are frequently targeted in effectiveness research, limiting generalizability to broader populations.

A series of effectiveness trials overcame this limitation by training college-aged leaders to deliver DBIs to peers of all risk levels, yielding positive effects on ED risk factors through long-term follow-up.¹³⁻¹⁶ Although intervention effects are sometimes smaller with peer-led DBI (PL-DBI) relative to professional delivery,¹⁷ PL-DBIs appear to be a highly sustainable model for large-scale intervention delivery,¹⁸ in part because they rely on community partnership and other principles of dissemination science.^{19,20}

Little is known about the feasibility of PL-DBIs with younger audiences,^{21,22} yet peer leaders are effective in delivering a variety of school-based health education interventions.²³ Prevention in mid-/late-adolescence is essential given this high-risk period for developing EDs,²⁴ and ED risk-reduction programming in this age range tends to be school-based and includes both

high- and low-risk individuals.²⁵⁻²⁸ Thus, the current pilot study investigated the effectiveness of a school-based, PL-DBI in reducing ED risk factors in high- and low-risk adolescent girls.

Research methods were collaboratively determined with the participating high school to create a program that was both evidence-based and acceptable to the school community. It was hypothesized that high-schoolers could successfully deliver a PL-DBI (1) with fidelity to an intervention manual, (2) that was acceptable to students and staff, and (3) that would produce positive effects on ED risk-factor outcomes.

Method

Participants and Procedures

All 9th grade girls in the participating high school received the PL-DBI as a mandatory health-class component [$n=51$; $M(SD)$ age=13.98 (0.59) years; $M(SD)$ BMI=20.92 (2.98) kg/m²; 40% Caucasian, 32% Hawaiian or Pacific Islander, 18% Other/Mixed, 10% Asian]. A quasi-experimental design allocated groups by classroom based on scheduling feasibility. Three health classes during the first school-quarter ($n = 25$) were allocated to the active group, and three health classes during the second quarter ($n = 26$) were allocated to the waitlist-control group. Two 1.5-hour DBI sessions were held 2 days apart. The two-session PL-DBI content has been previously described in detail.¹³ A published PL-DBI guide for college students²⁹ was modified to include examples/language relevant to high school culture. A section on cultural/ethnic beauty ideals was added to capture the diversity of the participating high school. Ten peer-leaders (nine 12th and one 11th grader) recruited by the school-counselor completed 12-hours of training over a two-day period (training methods previously described).¹³⁻¹⁶ Peer-leaders were screened for ED symptoms using the Eating Disorders Examination Questionnaire (EDEQ³⁰).

Groups of 3-4 peer-leaders led in-class intervention sessions with 6-12 group members. Each peer-leader team led one active and one waitlist group. The university Institutional Review Board approved all research procedures. Passive parental consent was obtained.

Measures

Intervention Adherence. Two independent raters coded audio-recorded sessions for the presence/absence of each intervention component. Kappa ratings were calculated to estimate inter-rater reliability.

Program Acceptability. Post-intervention questions assessed acceptability (rated on a 1-5 Likert scale from 1=not at all to 5=very much): (1) “how much did you enjoy the program”; (2) “how much did the program teach you new information.”

Risk-Factor Outcomes. All participants completed assessments before the study began (baseline) and one week later (active group post-intervention). At that time, the waitlist group received the intervention and was re-assessed one week later (waitlist post-intervention). All participants were re-assessed three months post-intervention (see Figure 1). Multiple measures, selected based on use in previous DBI trials, assessed four ED risk-factor outcomes. The Ideal Body Stereotype Scale-Revised (IBSS-R³¹) and the two internalization subscales (Internalization-General, Internalization-Athlete) of the Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3³²) assessed **thin-ideal internalization**. The 8-item Body Shape Questionnaire (BSQ^{33,34}) and the Weight Concern and Shape Concern combined subscales of the EDEQ (EDEQ-WSC³⁰) assessed **body dissatisfaction**. The Eating Attitudes Test (EAT-26³⁵) and the global score on the EDEQ (EDEQ-Total) assessed **eating pathology**. The Dieting subscale of the EAT-26 (EAT-Diet) and the Restraint subscale of the EDEQ (EDEQ-R) assessed **dietary restraint**. Cronbach’s alpha of all measures in this sample was

acceptable (IBSS-R=0.76, SATAQ-3=0.88, BSQ=0.93, EDEQ-WSC=0.86, EAT-26=0.92, EDEQ-Total=0.95, EAT-Diet=0.93, EDEQ-R=0.83).

Analyses

The final sample consisted of 50 participants (Active $n=24$; Waitlist $n=26$; see Figure 1 for participant flow). Participants with and without missing post-baseline data did not significantly differ on age, BMI, and baseline risk factor scores (all $ps>.30$). Nonetheless, baseline values were carried forward to account for missing scores, to conservatively estimate no improvement among individuals who did not complete these assessment points.

The two groups did not differ on age, BMI, and baseline risk factor scores (all $ps>.42$). Mixed-design ANOVA models assessed pre-post group differences. Separate models were run for each outcome variable with time as a repeated within-participants factor and intervention group as a between-participants factor. A series of repeated-measures ANOVA models assessed outcome changes across all participants (active/waitlist combined), with time as a within-participants factor; significant overall time effects were explored with post-hoc simple contrasts comparing baseline to other time points. All significance tests used a two-tailed alpha of 0.05. Effect sizes are reported using partial- η^2 .

Results

Intervention Adherence

Peer-leaders conducted sessions with acceptable levels of adherence to the manual, with $M(SD)=88.41\%(4.61\%)$ of intervention components covered across all sessions (M kappa ratings=0.71).

Program Acceptability

All participants (100%) indicated they enjoyed the program at least “a little” or more; 60% reported they enjoyed the program “a lot” or “very much.” Most participants (96%) indicated they learned at least “a little” new information; 68% reported they learned “a lot” or “very much” new information. Further, 43% said they were interested in becoming a future peer-leader.

Risk-Factor Outcomes

Pre-Post-Intervention Waitlist Comparison. Table 1 shows means, test statistics, and effect sizes from group-by-time interactions of models. Significant interactions were found for both internalization measures ($p < .0001$), body dissatisfaction as assessed by the BSQ-8 ($p = .005$), eating pathology as assessed by the EAT-26 ($p = .012$), and dietary restraint as assessed by the EAT-Diet ($p = .002$). Effect sizes ranged from medium to large. Interactions were not significant for the EDEQ-WCS, EDEQ-Global, or the EDEQ-R ($p > .062$).

Change Through Follow-Up. Across all participants, there were significant main effects for time on all eight outcome measures with large effect sizes ($p < .031$; see Table 1 for means, test statistics, and effect sizes). Internalization scores were significantly reduced from baseline to post-intervention but rebounded at follow-up (not significantly different from baseline). This same pattern was found for one measure of eating pathology (EAT-26). For body dissatisfaction, dietary restraint, and the second measure of eating pathology (EDEQ-Total), scores were significantly reduced from baseline to post-intervention; this difference was maintained through follow-up.

Discussion

This pilot study evaluated the feasibility, acceptability, and effectiveness of a PL-DBI with high school girls. To our knowledge, this is one of the first studies to assess a peer-delivered ED risk factor reduction program within a high school population.^{21,22}

Findings support the hypothesis that high schoolers can deliver a PL-DBI with high adherence to an age-tailored intervention manual. Furthermore, post-intervention feedback indicated that the program was considered highly acceptable. Study findings partially supported the hypothesis that a PL-DBI can reduce ED risk factors among high-school girls. Relative to a waitlist control, participants who received the program had greater reductions in scores from pre- to post-intervention than controls on one or more measures of each ED risk factor, although there was variability in effects within constructs depending on measurement instrument. Within-participant analyses assessing all 50 participants after the intervention found improvements in body dissatisfaction, eating pathology, and dietary restraint, sustained at three-months. While these results are encouraging, a controlled comparison at follow-up was not possible, and effect sizes are relatively modest compared to other trials.¹³⁻¹⁶ Discrepancies between measures assessing similar constructs (e.g., EAT-26 and EDEQ) were surprising and encourage caution in interpreting results. Contrary to hypotheses, reductions in thin-ideal internalization, the proposed mechanism for change in DBIs¹, were not sustained over time.

Several limitations of this study should be noted. The school's desire to allocate participants by classroom/schedule prohibited random allocation to condition. Relatedly, while individual level analyses were conducted, the trial was allocated on a group level but underpowered for analyses at the group level. Further limitations included lack of a long-term waitlist-controlled follow-up and relatively small sample size. Demand characteristics also are a concern in a repeated measures study, and low pre-intervention scores on study measures may

have created floor effects. Finally, generalizability may be limited, given that the participating school was small, private, rural, and ethnically diverse, although the latter may be considered a strength of this work.

In sum, the current study adds to literature on dissonance-based ED prevention by providing initial evidence of the feasibility, acceptability, and effectiveness of a peer-led delivery system implemented as part of a high-school curriculum. Future research is needed to replicate these results to continue striving toward the dual goals of sustainability in school settings and methodological rigor.

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Figure 1. Participant flow by group (active or waitlist) and study flow over the academic school year for the intervention, one week post/waitlist assessment, and 3-month follow-up assessment

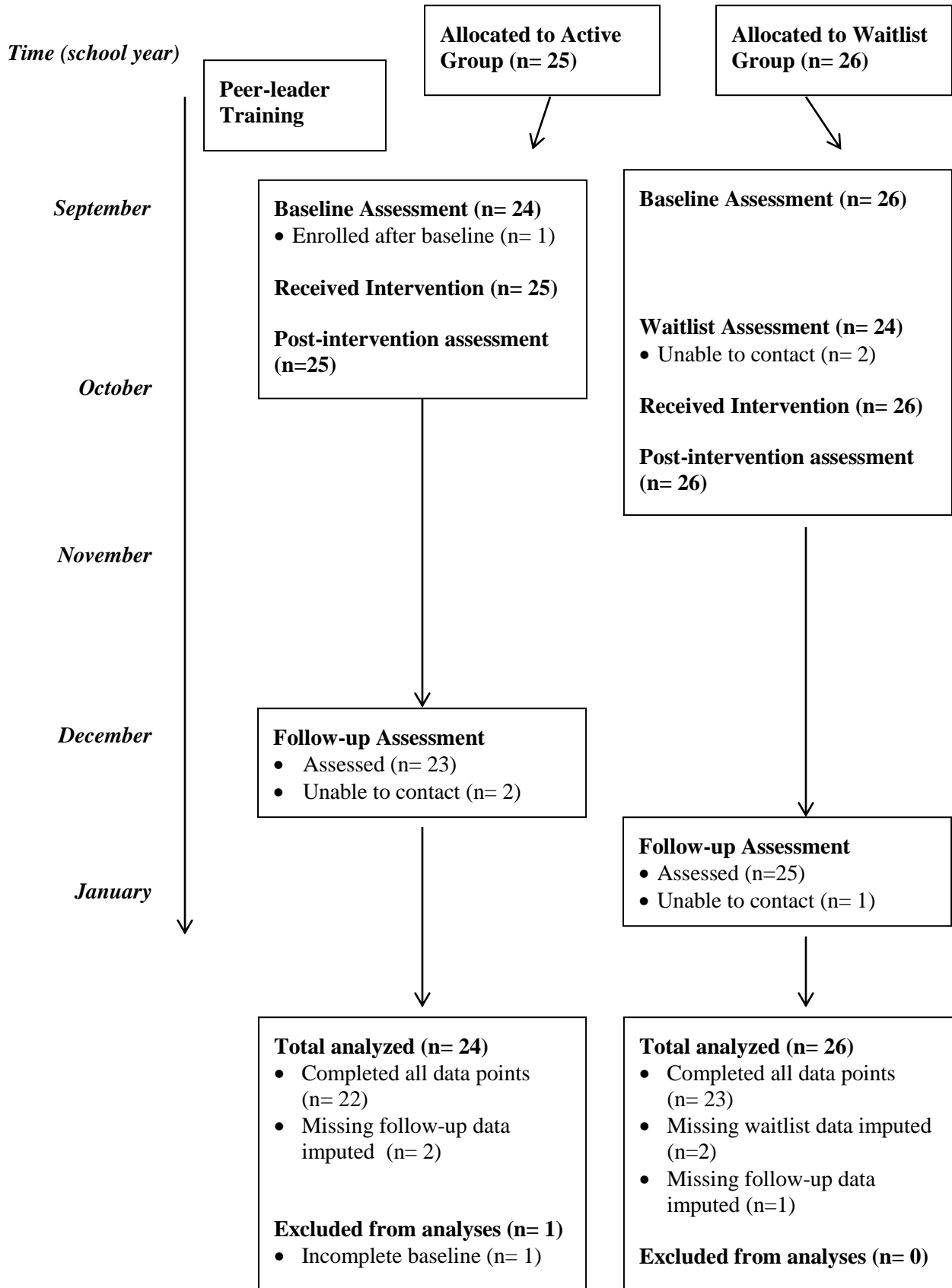


Table 1. Risk factor outcome scores and test statistics for pre-post intervention vs. waitlist comparison and change across the total sample from baseline through 3-month follow-up

		Baseline	Post	Follow-up	Test Statistic
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
Internalization					
IBSS-R	Active	3.28 (0.55)	2.79 (0.64)	--	$F(1,48) = 17.47, p = .000,$ partial $\eta^2 = .27$
	Waitlist	3.33 (0.54)	3.37 (0.71)	--	
	Total	3.31 _a (0.54)	2.88 _b (0.72)	3.21 _a (0.72)	$F(2,48) = 12.84, p = .000,$ partial $\eta^2 = .35$
SATAQ-3	Active	40.79 (9.54)	31.04 (9.24)	--	$F(1,48) = 28.38, p = .000,$ partial $\eta^2 = .37$
	Waitlist	40.46 (11.34)	38.75 (11.09)	--	
	Total	40.62 _a (10.41)	34.70 _b (10.89)	39.60 (9.71) _a	$F(2,48) = 12.80, p = .000,$ partial $\eta^2 = .35$
Body Dissatisfaction					
BSQ-8	Active	2.45 (1.08)	1.81 (0.64)	--	$F(1,48) = 8.80, p = .005,$ partial $\eta^2 = .16$
	Waitlist	2.81 (1.20)	2.72 (1.30)	--	
	Total	2.64 _a (1.15)	2.12 _b (1.04)	2.13 _b (1.11)	$F(2,48) = 10.65, p = .005,$ partial $\eta^2 = .31$
EDEQ-WSC	Active	1.71 (1.54)	1.17 (1.18)	--	$F(1,48) = 3.65, p = .062,$ partial $\eta^2 = .07$
	Waitlist	2.45 (1.83)	2.34 (1.82)	--	
	Total	2.09 _a (1.72)	1.57 _b (1.49)	1.45 _b (1.30)	$F(2,48) = 9.99, p = .000,$ partial $\eta^2 = .29$
Eating Pathology					
EAT-26	Active	1.93 (0.81)	1.64 (0.71)	--	$F(1,48) = 6.89, p = .012,$ partial $\eta^2 = .13$
	Waitlist	2.10 (0.71)	2.14 (0.97)	--	
	Total	2.02 _a (0.76)	1.77 _b (0.77)	1.91 _a (0.88)	$F(2,48) = 8.33, p = .001,$ partial $\eta^2 = .26$

Table 1, continued. Analysis of risk factor outcomes over time

		Baseline	Post	Follow-up	Test Statistic
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
EDEQ-Total	Active	1.39 (1.32)	0.91 (0.99)	--	$F(1,48) = 3.26, p = .077,$ partial $\eta^2 = .06$
	Waitlist	2.01 (1.57)	1.90 (1.52)	--	
	Total	1.71 _a (1.47)	1.27 _b (1.24)	1.19 _b (1.17)	$F(2,48) = 9.90, p = .000,$ partial $\eta^2 = .29$
Dietary Restraint					
EAT-Diet	Active	2.18 (1.13)	1.69 (0.86)	--	$F(1,48) = 11.91, p = .002,$ partial $\eta^2 = .20$
	Waitlist	2.36 (1.01)	2.33 (1.20)	--	
	Total	2.28 _a (1.07)	1.85 _b (0.99)	2.03 _b (1.10)	$F(2,48) = 13.63, p = .000,$ partial $\eta^2 = .36$
EDEQ-R	Active	0.76 (1.08)	0.38 (0.70)	--	$F(1,48) = 1.03, p = .315,$ partial $\eta^2 = .02$
	Waitlist	1.13 (1.35)	1.02 (1.32)	--	
	Total	0.95 _a (1.23)	0.67 _b (1.05)	0.68 _b (1.16)	$F(2,48) = 3.73, p = .031,$ partial $\eta^2 = .13$

Note: For each outcome variable, the test statistic associated with the active and waitlist mean refers to the group by time interaction of active vs. waitlist comparison (active $n = 24$; waitlist $n = 26$). The test statistic associated with the total sample mean refers to the main effect of the baseline-post-follow-up within-participants comparison across the entire sample (Total $n = 50$). Means within the same row with different subscripts indicate significant differences between time points ($p < .05$). Original 1-6 scoring scale of EAT-26 was preserved to maintain as much individual variation within scores as possible; two EAT-26 items were removed in the total scale (items 13 and 26) and one item was removed in the EAT-Diet subscale (item 26) due to low item-total correlation.

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