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Effectiveness of an eating disorder preventative intervention in primary care medical settings

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ABSTRACT

Objective: To conduct a pilot effectiveness trial of a brief dissonance-based eating disorder preventative program, the *Body Project*, when implemented at primary care medical clinics.
Method: Sixty-six female adolescents between the ages of 13 and 17 who reported at least some body image dissatisfaction were recruited at two primary care clinics and randomized to *Body Project* groups or an educational video control condition; eating disorder risk factors and symptoms were measured at pretest, posttest, and 3-month follow-up.
Results: Body Project versus educational video control participants showed significantly greater reductions in thin-ideal internalization, pressure to be thin, dieting, and eating disorder symptoms at posttest, which were medium to large effect sizes. *Body Project* participants also showed greater decreases in body dissatisfaction and negative affect at posttest, though these moderate sized effects were not significant. Effects persisted through 3-month follow-up.
Conclusion: Average pre–post effect sizes ($d = 0.58$) compare favorably to those observed in past *Body Project* efficacy (average $d = 0.59$) and effectiveness trials (average *d*s of 0.43 and 0.69), suggesting that primary care clinics may represent a novel venue for offering and extending the reach of this eating disorder prevention program.

Eating disorders are a public health concern due to their prevalence, co-occurrence with other forms of psychopathology, and likelihood of being under-treated (Hudson, Hiripi, Pope, & Kessler, 2007). Eating disorders affect 13–15% of adolescent and adult women (Allen, Byrne, Oddy, & Crosby, 2013; Stice, Marti, & Rohde, 2013), and are marked by chronicity, relapse, distress, functional impairment, increased risk for future obesity, depression, suicide attempts, anxiety disorders, substance abuse, morbidity, and mortality (Allen et al., 2013; Crow et al., 2009; le Grange et al., 2006; Stice, Marti, et al., 2013). Prevention is vital because the majority of individuals with eating disorders never receive treatment (Merikangas et al., 2011). Further, eating disorder treatment is costly and characterized by high relapse (Stice & Bulik, 2008). Thus, the dissemination of brief, effective prevention programs in primary care settings has potential to decrease the incidence of eating disorders and reduce health disparities for underserved and underinsured populations who may not otherwise have access to care.

Only three prevention programs have significantly reduced DSM-IV eating disorder symptoms (Atkinson & Wade, 2014; Stice, Butryn, Rohde, Shaw, & Marti, 2013; Stice, Marti, Spoor, Presnell, & Shaw, 2008). The broadest evidence-base has accumulated for the *Body Project*, a selective eating disorder prevention program that uses cognitive dissonance-inducing activities to reduce thin-ideal internalization in young females with body image concerns. Efficacy and effectiveness clinical trials show that the *Body Project* significantly reduces eating disorder risk factors (e.g., body dissatisfaction, thin ideal internalization), eating disorder symptoms, functional impairment, and future eating disorder onset relative to alternative interventions or assessment-only control groups in adolescent girls with body image concerns (Becker, Smith, & Ciao, 2005; Halliwell & Diedrichs, 2014; Mitchell et al., 2007; Stice, Butryn, et al., 2013; Stice et al., 2008; Stice, Shaw, Burton, &

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Wade, 2006). Given the robust evidence that the *Body Project* is effective for preventing eating disorders in young females, dissemination and implementation of the intervention in novel settings is a worthwhile next step.

Moreover, identifying settings for disseminating eating disorder prevention programs is an effective response to the public health concerns surrounding eating disorders. Researchers have reported that primary medical healthcare settings (such as family medicine or pediatric clinics) offer a promising opportunity for eating disorder screening and intervention, given the greater likelihood for a person to access primary healthcare versus specialized healthcare, such as mental health services (Clarke & Polimeni-Walker, 2004; Hoek & van Hoeken, 2003; Marques et al., 2011). Furthermore, utilization of health care services for medical concerns is elevated among individuals with subthreshold and threshold eating disorders and may increase within the year prior to an eating disorder diagnosis (Mitchell et al., 2009; Striegel-Moore et al., 2005). In a qualitative study, women who had recovered from eating disorders emphasized the importance of timely screening by primary care medical providers as an important step toward accessing preventative and treatment interventions (Linville, Brown, Sturm, & McDougal, 2012). Early assessment and intervention with eating disorders is also linked to successful restoration of health, with improved odds for patients who are 19 years of age or younger (Herzog et al., 1999; van Son, van Hoeken, van Furth, Donker, & Hoek, 2010).

Primary health care clinics are an ideal setting for implementing behavioral health prevention programs since they do not require youth and families to gain access to a specialty mental health clinic. That is, primary care facilities often serve a large number of youth so that individuals at risk can be easily identified, thereby increasing early detection and intervention, as well as potentially reducing eating disorder onset. For instance, primary care settings have been identified as an ideal location for delivery of depression prevention programs. In a randomized control trial (RCT), an intervention aimed at preventing depression among youth significantly prevented depression and anxiety related disorders among high-symptom patients (Gillham, Hamilton, Freres, Patton, & Gallop, 2006). In a separate RCT, two versions of an Internet-based intervention in primary care aimed at preventing depressive disorders among adolescents resulted in declines in depressed moods and future onset of clinical depression symptoms for both groups (Van Voorhees et al., 2009). The levels of participants' attendance, intervention fidelity, and effectiveness of these behavioral health interventions for adolescents in primary care provides more evidence that primary care facilities might be useful for implementing eating disorder prevention programs.

Despite primary medical settings being an opportune setting for intervention with eating disorders, medical providers often report feeling ill-equipped to address eating disorders and express hesitancy in even screening for disordered eating unless they believe that an appropriate intervention will be available (Linville, Benton, O'Neil, & Sturm, 2010; Linville, Brown, & O'Neil, 2012). Furthermore, researchers have found that only one third of individuals with an eating disorder had been asked about problems with eating by a primary care practitioner or other health professional (Mond, Myers, Crosby, Hay, & Mitchell, 2010), suggesting that medical providers' concerns are a potential barrier to appropriate intervention. Giving healthcare providers the resources to intervene effectively within primary care settings ought to improve the reach of universal, selective, and indicated eating disorder prevention programs. Ultimately, this extended reach could play a crucial role in reducing the prevalence of these pernicious conditions.

Given the robust evidence that the *Body Project* is effective when conducted in educational settings, a logical next step is to understand and test dissemination and implementation processes for the *Body Project* in a new type of setting: primary care medical clinics. These clinics are an ideal setting for implementing effective selected and indicated eating disorder prevention programs because it is easy to identify youth who are at risk for eating disorders and to medically monitor adolescents who already have an eating disorder in this setting. In addition, primary care settings have a variety of clinicians that could appropriately deliver the intervention (nurses, social workers, behavioral health workers).

1. Purpose of study

The purpose of this study was to pilot test the effectiveness of the *Body Project*, using a quasi-RCT study design, when implemented in two primary care medical clinics. One primary care site was a large public pediatric clinic and the other site was a small private family medicine practice. The overarching research question was, "Is the *Body Project* still effective when delivered in the novel setting of primary care medical clinics?" A secondary research question was "How does the uptake, adoption and implementation process differ across the two types of primary care medical sites?" We hypothesized the participants randomly assigned to receive the *Body Project* would report a decrease in eating disorder risk factors and symptoms at post-test compared to active educational video control group participants. Second, we hypothesized that the smaller family medicine clinic would show greater adoption and uptake of the *Body Project* than the larger pediatric clinic, given that there were fewer providers to coordinate with and less logistical challenges compared to the larger medical institution. To date, this is the only known study that has implemented this evidence-based eating disorder prevention program in primary care medical settings.

2. Method

2.1. Participants

Participants were 66 young females (M age = 14.9, SD = 1.5, range 13–17) with a mean baseline BMI of 24.0 (SD = 7.7). For participants that reported race (20% did not self-identify their race), the sample was 2% African American, 2% Asian, 15% Hispanic, and 72% European American, and 9% reported "other." As a measure of risk for the sample, 20% of the sample had a full or partial syndrome eating disorder at baseline: 8% full syndrome bulimia nervosa, 2% full-syndrome binge eating disorder, 3% partial syndrome anorexia nervosa, 6% partial syndrome bulimia nervosa, and 2% partial syndrome binge eating disorder.

2.2. Sites and dissemination process

Information regarding the evidence-base for the *Body Project* study was disseminated at two primary care settings. Both sites adopted the *Body Project* for implementation at their respective clinics. Key stakeholders were identified at both sites by establishing relationships with the clinic managers and physicians most interested in eating disorder prevention. The principal investigator identified key stakeholders and initiated these relationships through e-mail and phone calls. Both sites had previously been involved with another study, also conducted by the first author, which tested the effectiveness of a training intervention for medical providers on their self-perceived knowledge, skills and attitudes toward eating disorders.

Although adoption processes were similar, intervention uptake was different across the two sites. Recruitment was much easier and quicker at the private family medicine group practice. We used

community participatory research methods to gather input from providers about a recruitment plan. Providers at the larger medical clinic expressed confidence that they could recruit eligible patients during their medical exams or physicals and that the mailing was not necessary. The small family practice clinic suggested doing a mailing to all families with adolescent females, as well as referring directly to the study. Through the generation of informal qualitative feedback from the key stakeholders, we used differing recruitment methods at the two sites. At both sites, recruitment fliers were posted in exam rooms and the lobby. In addition, providers stated that they would tell patient families about the project. These two recruitment methods were less effective and slowed down recruitment significantly because providers acknowledged that they would often forget about the project unless a patient or family member was red flagged for already having an eating disorder or the patient brought up body dissatisfaction as a presenting issue. In addition, most adolescents do not routinely visit their primary care provider office unless they are sick or there is a problem. Therefore, the study team decided that additional recruitment methods were needed that would have the capacity to reach more adolescents. The pediatric clinic was part of a large institution, and their institutional review board disallowed direct mailings to all patient families with adolescents. In contrast, when the small family medicine clinic became a second site, providers quickly approved a direct mailing to all of their families with an adolescent female in their household. Ultimately, the direct mailing seemed to be the most effective recruitment strategy. Only one mailing was necessary to recruit the necessary number of participants at the family medicine clinic. In total, twenty-four families from the small family medicine clinic and forty-four families from the pediatric clinic were assessed for eligibility.

2.3. Procedures

We obtained approval from two separate institutional review boards; one institution was a large, public university and the second was the larger pediatric medical site. As the smaller family medicine clinic site was a private practice, it did not have its own institutional review board. From February 2012 to June 2014, participants were recruited and randomly allocated to either the control group, in which they watched a film called *Dying to Be Thin* (Sarandon & McPhee, 2000) or completed the group-based *Body Project* intervention. At the smaller family medicine site, all participants were recruited from the direct mailing, whereas at the larger pediatric site, participants were recruited from medical provider referral or seeing the flier in the exam room. Interested adolescents or their legal guardian contacted research assistants by phone or e-mail. Participants and caregiver(s) met with a research assistant prior to the initial session to give their assent/consent to participate in the study, as well as to complete a brief screening tool to ensure they met inclusion criteria.

Fig. 1 depicts the participant flow diagram. Approximately 250 families with adolescents who were patients at the family practice clinic were sent recruitment materials through direct mailing. We are unable to estimate how many adolescents and families were told by pediatric providers about the *Body Project* study or saw the fliers posted in the larger pediatric clinic exam rooms or waiting areas. A total of sixty-eight adolescent families across both sites contacted the project personnel expressing interest in the study. Randomization occurred at the time of the initial phone call by using a flip of a coin technique for the first caller at each site. We allocated in blocks of eight for each site with the first eight participants going into one condition, the next eight going into the other condition, and so on. Since the first caller was randomized into the intervention group, the next seven callers were also

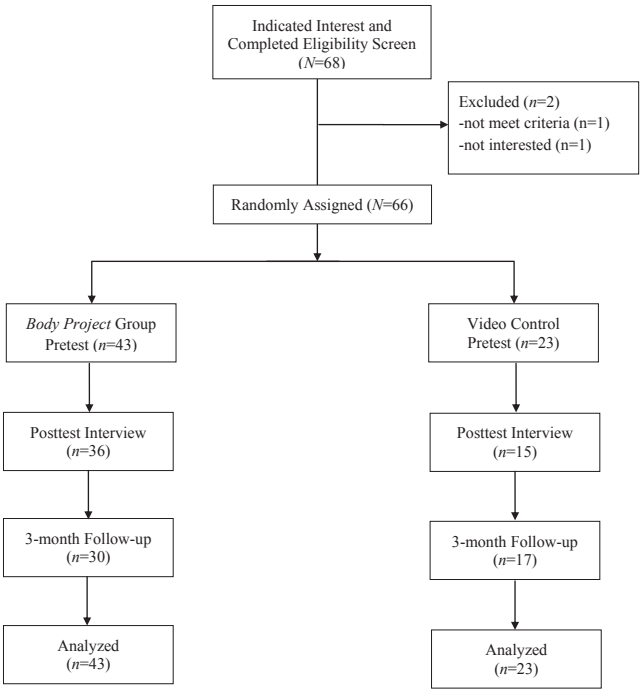

Fig. 1. Consort diagram.

functionally allocated into the intervention group. Then, the next eight callers were randomized into the video control condition. Although from a mathematical standpoint each participant had a 50:50 chance of ending up in each condition, randomization was not completely independent for each participant. Therefore, it might be best to consider this a quasi-randomized trial. Randomization happened separately at the two sites. At our second medical setting, we ended the study with having run two intervention groups and only one control group, leading to unequal cell sizes. All participants completed assessments at pretest, posttest, and 3 months after posttest. Participants were paid a total of $45 upon completion of either the control intervention or the group intervention: $10 after the first assessment, $15 after the second, and $20 after the third.

Participants were eligible to participate if they reported body image dissatisfaction, identified as female, were between the ages of 13 and 17 years of age, and spoke English or Spanish. Participants who endorsed eating disorder symptoms were not excluded from this trial because in prior *Body Project* trials, individuals with a DSM-IV eating disorder diagnosis showed significantly greater reductions in outcome variables in response to the *Body Project* intervention compared to participants without an eating disorder diagnosis (Müller & Stice, 2013). At the initial screening meeting, assessors sought verbal confirmation that the potential participants had body image concerns by asking them, “Do you feel dissatisfied with your body or experience any body image dissatisfaction?” All but one potential participant who attended the initial screening endorsed at least some body image dissatisfaction. Next, we explained the process for participation to both the adolescent and the legal guardian and obtained their written and verbal consent for study participation.

The *Body Project* group intervention consisted of four weekly 1-h group sessions with five to eight participants. In session 1, participants collectively define the thin-ideal, discuss costs of pursuing this ideal, and are assigned home exercises (e.g., write an essay about the costs associated with pursuing the thin-ideal). In session

2, participants discuss each home exercise, dissuade facilitators from pursuing the thin-ideal in role-plays, and are assigned more exercises (e.g., generate a top-10 list of things young women can do to challenge the thin-ideal). In session 3, participants discuss home exercises, conduct role-plays challenging thin-ideal statements, discuss personal body image concerns, and are assigned home exercises (e.g., engage in a behavior that challenges their body image concerns). In session 4, participants discuss home exercises, plan for future pressures to be thin, discuss perceived benefits of the group, and are assigned exit home exercises (e.g., write a letter to a younger adolescent girl about avoiding development of body image concerns). Several adaptations were made to the intervention to enhance dissonance induction. To underscore the voluntary nature of the intervention, participants are (a) reminded that participation is voluntary at the start of each session and (b) told that homework is not required (Stice, Butryn, et al., 2013; Stice, Marti, et al., 2013). See Stice, Butryn, et al. (2013) and Stice, Marti, et al. (2013) for a more in-depth description of the four-session version of the *Body Project* intervention.

Behavioral health interns working at both clinics delivered the interventions. Interventionists were trained in person by the intervention developer, Dr. Eric Stice, or by the first author, in addition to watching a training video produced by Dr. Stice. In some cases, interventionists co-facilitated their first group with an experienced *Body Project* facilitator, but this was not consistent across the entire study. Interventionists were trained by the first author on methods of tracking participant involvement, adhering to confidentiality, and role-playing, in addition to receiving direct feedback on taped sessions. All intervention groups were audio-recorded and a random 30% were evaluated for fidelity using existing *Body Project* intervention adherence and competence scoring rubrics that had been used in previous *Body Project* trials. The researcher who conducted the fidelity checks had conducted them for a previous *Body Project* trial; inter-rater agreement was good for adherence (ICC = 0.65) and competence (ICC = 0.72) in that trial (Stice, Butryn, et al., 2013; Stice, Marti, et al., 2013). The interventionists that were rated received average scores in the 70s and 80s for both adherence and competence (on a scale of 10–100 with "10" indicating no adherence or competence and "100" indicating perfect adherence and competence).

2.4. Measures

2.4.1. Thin-ideal internalization

The 8-item Ideal-Body Stereotype Scale-Revised assessed thin ideal internalization (Stice et al., 2006). Response options ranged from 1 = *strongly disagree* to 5 = *strongly agree*. A composite score was computed as an average of the items, as were scales described subsequently. This scale has shown internal consistency (α = .91) and 2-week test-retest reliability (r = 0.80; Stice et al., 2008; pretest α = .91 in current study).

2.4.2. Perceived pressure to be thin

The 9-item Perceived Sociocultural Pressure Scale assessed perceived pressure to be thin from family, friends, dating partners, and the media (Stice, Presnell, & Spangler, 2002). Response options ranged from 1 = *strongly disagree* to 5 = *strongly agree*. This scale has shown internal consistency (α = .88) and 2-week test-retest reliability (r = 0.93; Stice et al., 2002; pretest α = .93 in current study). This risk factor was not measured in other *Body Project* effectiveness trials.

2.4.3. Body dissatisfaction

The 9-item Satisfaction and Dissatisfaction with Body Parts Scale (Berscheid, Walster, & Bohrnstedt, 1973) assessed dissatisfaction with body parts. Response options ranged from 1 = *extremely satisfied* to 6 = *extremely dissatisfied*. This scale has shown internal consistency (α = .94) and 3-week test-retest reliability (r = 0.90; Stice et al., 2008; pretest α = .95 in current study).

2.4.4. Dieting

The 10-item Dutch Restrained Eating Scale (DRES; van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986) assessed the frequency of dieting behaviors using a response scale ranging from 1 = *never* to 5 = *always*. The DRES has shown internal consistency (α = .95) and 2-week test-retest reliability (r = 0.82; Stice et al., 2008; pretest α = .95 in current study).

2.4.5. Negative affect

Negative affect was assessed with 18-items from the fear, guilt, and sadness subscales of the Positive Affect and Negative Affect Scale-Revised (PANAS-X; Watson & Clark, 1992) and three additional items that assessed anxiety and depression. Participants reported the extent to which they had felt various negative emotions in the past week, with response options ranging from 1 = *not at all* to 5 = *extremely*. This scale has shown internal consistency (α = .95) and good 3-week test-retest reliability (r = 0.78; Stice et al., 2006; pretest α = .97 in current study).

2.4.6. Eating disorder symptoms

Eating disorder symptoms and diagnoses over the past 30 days were assessed with the 22-item Eating Disorder Diagnostic Screen (EDDS; Stice, Fisher, & Martinez, 2004). The symptom composite from the EDDS has shown internal consistency (α = .89) and 1-week test-retest reliability (r = 0.87; Stice, Telch, & Rizvi, 2000; Stice et al., 2004; pretest α = .86 in current study).

2.5. Analysis plan

Multiple imputation was used to replace missing values following best-practice recommendations (Graham, 2009). Missing data were imputed using the IVEware program (Raghunathan, Solenberger, & Van Hoewyk, 2002), which uses all available data to impute missing data via a sequential regression approach. Missing data points were replaced with imputed data in 20 data sets, which were analyzed separately. Model parameters and standard errors were combined following Rubin (1987), as implemented in the PROC MIANLYZE procedure (SAS Institute Inc., 2011).

Mixed effects linear growth models from posttest to 3-month follow-up were fit with the PROC MIXED procedure (SAS Institute Inc., 2011). Baseline measure of the outcome and site were included as covariates and the study condition was included as a dummy coded vector (1 = *Body Project*, 0 = video only controls). Interpretation of effects for condition represents group differences at the posttest assessment and the condition by time interactions represent group differences in growth rates from the posttest to the 3-month follow-up assessment. The intercept and time parameters were specified as random. To accommodate the partially nested structure of the data, controls were treated as a group of one (Bauer, Sterba, & Hallsfors, 2008). If the variance of a random effect at the group-level was estimated as not significantly different from zero, it was removed from the model and rerun. The interaction of site with study condition was non-significant for all outcomes and thus excluded in the final models. Effect sizes were estimated by converting t values to d effect sizes (Rosnow & Rosenthal, 2008).

3. Results

All 66 participants completed the pretest assessment, 77% the posttest assessment, and 71% the 3-month follow-up assessment.

The number of completed assessments was not related to study condition ($\chi^2[1,66] = 0.03$, $p = .855$), but participants who did not complete all assessments had higher baseline dieting ($t[64] = 2.24$, $p = .014$; Mean = 3.00 vs. 2.37), body dissatisfaction ($t[64] = 2.79$, $p = .007$; Mean = 3.67 vs. 3.03), negative affect ($t[64] = 2.35$, $p = .022$; Mean = 2.60 vs. 2.00), and eating disorder symptoms ($t[64] = 2.42$, $p = .018$; Mean = 1.44 vs. 0.91) than those who provided complete data.

Participants in the *Body Project* versus educational video control condition were compared on demographics and pretest measures of the outcomes. No differences were found with the exception of recruitment site ($\chi^2[1,66] = 3.86$, $p = .049$). Sites were compared on demographic and pretest measures of the outcomes and no significant differences were found.

Table 1 provides means and standard deviations for study outcomes. Results of the mixed effects growth models are presented in Table 2. There were significant condition effects at posttest for thin-ideal internalization, pressure to be thin, dieting, and eating disorder symptoms, with estimates showing greater pre–post decreases for *Body Project* versus video control participants. *Body Project* participants also showed greater decreases in body dissatisfaction and negative affect at posttest, though these moderate sized effects were not significant. Group by time interactions were all non-significant, indicating that the rate of change between posttest and 3-month follow-up did not differ between *Body Project* and video control participants and that the greater pre–post decreases for *Body Project* participants maintained through follow-up.

4. Discussion

Results imply that a brief eating disorder preventative intervention has the potential for being successfully implemented in integrated primary care medical settings; although possible concerns regarding feasibility of future real world implementation are discussed in the limitations section. Further, results indicate the *Body Project* is effective for reducing risk factors and eating disorder symptoms. The *Body Project* intervention, when implemented in primary care, produced significant reductions in thin-ideal internalization, perceived pressure to be thin, dieting, and eating disorder symptoms. Although non-significant, the decreases in body dissatisfaction and negative affect from pre to posttest for *Body Project* versus control participants for this effectiveness trial were moderate in size and only slightly smaller than those of other trials comparing *Body Project* to control participants (see Table 3). The average intervention effect sizes from the current trial (average $d = 0.58$) were larger than the parallel effects from the efficacy trial (average $d = 0.59$) and similar to those from the effectiveness trials (average *d*s of 0.43 and 0.69). It is important to note that these significant results were found despite having used an educational video control condition that demonstrated some benefit in a previous prevention trial relative to assessment-only controls (Stice, Rohde, Durant, & Shaw, 2012).

Table 1
Means and standard deviations for study outcomes.

	Video control		Body project	
	Mean	SD	Mean	SD
Thin-ideal internalization				
Pretest	3.34	0.63	3.16	0.81
Posttest	3.28	0.85	2.70	0.73
3-month follow-up	3.28	0.51	2.86	0.79
Perceived pressure to be thin				
Pretest	3.34	0.85	3.05	0.93
Posttest	3.04	0.92	2.24	0.85
3-month follow-up	3.42	0.77	2.67	0.73
Dieting				
Pretest	2.73	1.08	2.49	0.99
Posttest	2.52	1.09	1.84	0.78
3-month follow-up	2.57	0.98	1.93	0.71
Body dissatisfaction				
Pretest	3.33	1.00	3.19	0.84
Posttest	3.16	0.87	2.80	0.91
3-month follow-up	2.89	0.79	2.73	0.80
Negative affect				
Pretest	2.16	0.96	2.22	1.02
Posttest	2.25	1.05	1.85	0.78
3-month follow-up	2.13	0.98	1.83	0.64
Eating disorder symptoms				
Pretest	1.11	0.73	1.08	0.92
Posttest	1.10	0.67	0.77	0.71
3-month follow-up	1.10	0.77	0.68	0.65

SD = standard deviation.
Notes. Means and standard deviations averaged across 20 imputed datasets.

The impact of the *Body Project* on these particular factors is important, as the presence of perceived pressure to be thin, thin-ideal internalization, and body dissatisfaction in early adolescence are risk factors for the development of eating disorders in later adolescence (Rohde, Stice, & Marti, 2015). Additionally, Rohde et al. (2015) found that the predictive effects of perceived pressure to be thin and thin-ideal internalization were particularly salient at the age of 14. Since the mean age of participants in this study was 14.9 years old, this brief preventative intervention's significant effect on thin-ideal internalization and perceived pressure to be thin suggests that this intervention should be considered for more broad implementation and future study. Moreover, the effect of this intervention on dieting is also notable, as dieting is one of the most critical predictors of new eating disorders for adolescent girls (Patton, Selzer, Coffey, Carlin, & Wolfe, 1999).

Perhaps even more important than the significant intervention effects, is that this brief eating disorder program was not only implemented successfully in two primary care medical settings, but there was preliminary evidence of the sustainability of the program, with the clinics asking to continue providing the *Body Project* groups at the end of the effectiveness trial study. Medical providers were invested in preventing eating disorders and were interested in continuing to refer patients to the program. Yet, participant enrollment was more successful when a mailing was an approved recruitment method and so in settings in which this strategy is disallowed, successful implementation may be more challenging. Also, it would be useful for future research to evaluate the cost effectiveness of implementing this selected and indicated prevention program in medical clinics. Such a brief and effective intervention may be at least cost-neutral for primary care medical settings that provide care for a large population of adolescent females.

4.1. Limitations

When interpreting the findings from this study, it is important to consider the limitations. First, the small sample size limited sensitivity to detecting intervention effects and generalizability. Second, this was a fairly homogenous group of participants, with 72% identifying as European American. With low levels of racial/ethnic diversity, generalizability is limited. Third, we were not able to conduct longer-term follow up to explore possible attenuation of the effects of the intervention over a more extended period. Fourth, recruitment occurred over a period of 2.5 years, and was hindered by factors such as providers often forgetting to refer patients and adolescents not routinely attending sessions. Strategies to mitigate recruitment limitations are discussed below; however, when considering the feasibility of future implementation, it is important to acknowledge that study participants received gift card incentives

Table 2
Model Parameters for *Body Project* vs. Video Control Comparison.

Variable	Parameters	Est.	SE	t-value	p-value	d	95% CI of d	
							LB	UB
Thin-ideal internalization	Intercept	2.407	0.408	5.89	<0.001	1.47	0.98	1.96
	Pretest thin ideal internalization	0.311	0.107	2.92	0.004	0.73	0.24	1.22
	Site	0.242	0.162	−1.50	0.135	−0.38	−0.55	−0.25
	Condition	−0.567	0.199	−2.85	0.005	−0.71	−0.99	−0.48
	Time	0.006	0.047	0.14	0.891	0.04	−0.46	0.53
	Condition × Time	0.038	0.056	0.70	0.483	0.18	−0.32	0.67
	Intercept	0.251	0.079	3.17	0.002			
	Time	0.005	0.007	0.72	0.469			
	Residual	0.160	0.055	2.89	0.004			
Pressure to be thin	Intercept	1.445	0.350	4.13	<0.001	1.03	0.54	1.52
	Pretest Pressure to be Thin	0.511	0.090	5.65	<0.001	1.41	0.92	1.91
	Site	0.154	0.206	−0.75	0.454	−0.19	−0.68	0.30
	Condition	−0.663	0.229	−2.91	0.004	−0.73	−1.22	−0.21
	Time	0.124	0.060	2.08	0.038	0.52	0.03	1.01
	Condition × Time	−0.015	0.071	−0.20	0.838	−0.05	−0.54	0.44
	Intercept (group-level)	0.074	0.082	0.91	0.363			
	Intercept	0.102	0.085	1.19	0.236			
	Time	0.006	0.008	0.79	0.431			
	Residual	0.283	0.091	3.12	0.005			
Dieting	Intercept	0.895	0.245	3.65	<0.001	0.91	0.42	1.40
	Pretest dieting	0.633	0.079	7.96	<0.001	1.99	1.50	2.48
	Site	0.151	0.158	0.95	0.341	0.24	−0.73	0.25
	Condition	−0.554	0.169	−3.28	0.001	−0.82	−1.31	−0.33
	Time	0.018	0.037	0.50	0.618	0.13	−0.37	0.62
	Condition × Time	0.007	0.041	0.17	0.861	0.04	−0.45	0.54
	Intercept	0.267	0.073	3.66	<0.001			
	Time	0.006	0.004	1.28	0.200			
	Residual	0.077	0.030	2.61	0.010			
Body dissatisfaction	Intercept	2.129	0.345	6.17	<0.001	1.54	1.05	2.03
	Pretest body dissatisfaction	0.380	0.092	4.13	<0.001	1.03	0.54	1.52
	Site	0.302	0.219	1.38	0.168	0.35	−0.84	0.15
	Condition	−0.406	0.257	−1.58	0.115	−0.40	−0.89	0.10
	Time	−0.092	0.076	−1.21	0.230	−0.30	−0.79	0.19
	Condition × Time	0.073	0.089	0.83	0.409	0.21	−0.28	0.70
	Intercept (group-level)	0.072	0.072	1.00	0.320			
	Intercept	0.088	0.128	0.69	0.496			
	Time	0.005	0.009	0.50	0.618			
	Residual	0.438	0.113	3.87	<0.001			
Negative affect	Intercept	1.421	0.308	4.61	<0.001	1.15	0.66	1.64
	Pretest negative affect	0.367	0.098	3.75	<0.001	0.94	0.45	1.43
	Site	−0.052	0.187	−0.28	0.781	−0.07	−0.42	0.56
	Condition	−0.416	0.232	−1.79	0.075	−0.45	−0.94	0.05
	Time	−0.040	0.050	−0.80	0.423	−0.20	−0.69	0.29
	Condition × Time	0.036	0.058	0.61	0.542	0.15	−0.34	0.64
	Intercept	0.375	0.109	3.45	0.001			
	Time	0.006	0.009	0.67	0.501			
	Residual	0.197	0.081	2.42	0.018			
Eating disorder symptoms	Intercept	0.500	0.161	3.07	0.001	0.77	0.26	1.24
	Pretest ED symptom	0.523	0.072	7.30	<0.001	1.83	1.30	2.28
	Site	0.021	0.124	0.17	0.866	0.04	−0.43	0.55
	Condition	−0.289	0.144	−1.99	0.046	−0.50	−0.96	0.02
	Time	0.004	0.052	0.08	0.940	0.02	−0.47	0.52
	Condition × Time	−0.040	0.067	−0.61	0.545	−0.15	−0.66	0.32
	Time (group-level)	0.006	0.006	1.01	0.313			
	Intercept	0.081	0.047	1.73	0.087			
	Residual	0.183	0.044	4.19	<0.001			

SE = standard error, d = Cohen's d-statistic, CI = confidence interval, LB = lower 95% bound, UB = upper 95% bound. Random effects parameters are italicized and are at the individual level unless otherwise specified as group-level.

for completing assessments. Finally, participants that failed to complete all assessments showed elevated risk factors and eating disorder symptoms at pretest, potentially posing a threat to the internal validity of the study. Perhaps the individuals that were most affected by eating disorder symptoms did not feel that the brief intervention adequately addressed their treatment needs and therefore, were more likely to drop out. The higher attrition rate could also be due to participants having to come to a medical clinic for the groups, which requires more effort and planning than is the case when the intervention is implemented on high school or college campuses that the students attend. However, these concerns are mostly mitigated with the use of multiple imputation procedures allowing for the analysis of all participants randomized to the study.

4.2. Future directions

Future research is needed in the area of dissemination and implementation of effective eating disorder prevention strategies, like the *Body Project,* in primary care medical settings. Researchers

Table 3
Effect Sizes (d) Comparing Body Acceptance (or *Body Project*) vs. Controls.

	Thin-ideal internalization	Body diss.	Dieting	Negative affect	Eating disorder symptoms	Mean effect size
Posttest effects						
Efficacy trial	0.82	0.75	0.56	0.49	0.34	0.59
High school effectiveness	0.43	0.58	0.41	0.24	0.49	0.43
College effectiveness	0.79	0.86	0.75	0.57	0.50	0.69
Primary care pilot	0.71	0.40	0.82	0.45	0.50	0.58
Follow-up effects						
Efficacy trial	0.61	0.58	0.35	0.24	0.37	0.43
High school Effectiveness	0.04	0.24	0.22	0.02	0.28	0.16
College effectiveness	0.48	0.54	0.47	0.38	0.40	0.45
Primary care pilot	0.55	0.18	0.75	0.35	0.56	0.48

Notes. Efficacy trial (n = 241; Mean age = 17.0; Stice et al., 2006); High school effectiveness (n = 306, Mean age = 15.7; Stice, Rohde, Gau, & Shaw, 2009); College effectiveness (n = 408, Mean age = 21.6; Stice, Butryn, et al., 2013); Primary care pilot (n = 66, Mean age = 14.9).

should identify strategies for systematically engaging key stakeholders at primary care medical clinics, particularly those that already have behavioral health integrated into their system. For this study, previous professional relationships may have aided in key stakeholders adopting the *Body Project* intervention at their respective sites. Examining whether or not this particular eating disorder prevention program showed preliminary effectiveness when delivered in primary care settings was an important first step for these dissemination and implementation efforts. The next step is to conduct a larger implementation study with the primary focus on evaluating the success of the actual delivery systems. Once key stakeholders are identified and primary care sites have chosen to adopt the intervention, it will be vital to explore methods for sustaining intervention delivery. Future studies are needed to continue to understand logistical procedures (i.e., billing services, systematic training of interventionists, etc.) necessary to ensure the feasibility and sustainability of this intervention in primary care settings.

Recruitment was expedited when direct mailing of information about the *Body Project* to patients meeting eligibility criteria was permitted. For future dissemination, direct contact with potential participants, such as by mailings, telephone, e-mail, and patient portals, might prove vital. However, not all primary care clinics permit this practice or have resources to do so. Clinics with and without such limitations could benefit from further education and training in the identification of eating disorders and the benefits of preventative and early intervention. Primary care clinics with integrated behavioral/mental health care could potentially screen patients with body image concerns more efficiently than those without, potentially increasing the ecological validity of the intervention.

Although the brevity of the intervention is desirable and cost-effective, the short sessions may have limited the natural group dynamic, especially as the participants seemed to motivate each other to challenge the *thin ideal*. When soliciting qualitative feedback from participants, they stated a desire for more time to talk about each exercise in order to fortify the group experience and emphasize the intent of the sessions. It is possible that longer sessions could produce even stronger effects and this would be a worthwhile future research direction.

Social and cultural values shape one's subjective experience, expression, and identity. Further, eating behaviors and practices are often culturally and socially determined (Henrickson, Crowther, & Harrington, 2010; Orji & Mandryk, 2014). Although the *Body Project* has been found to produce similar effects for various ethnic minority groups (Stice, Marti, & Cheng, 2014), future studies should examine whether the intervention would have a greater impact if the *Body Project* were culturally adapted for specific groups. Further, future studies should focus on evaluating the impact of the *Body Project* in other countries, including non-western collectivist nations. These international studies would provide important findings to determine the level of cultural adaptation necessary to yield similar results, while maintaining fidelity to the intervention. Given the prevalence, chronicity, cost, and lack of access to services associated with eating disorders, disseminating and implementing efficacious preventative interventions that are cost-effective into primary care settings is an innovative way to intervene and prevent eating disorders among adolescent females.

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