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Reducing Eating Disorder Risk Factors: A Pilot Effectiveness Trial of a Train-the-Trainer Approach to Dissemination and Implementation

Rebecca Greif

Carolyn Becker
Trinity University, cbecker@trinity.edu

Tom Hildebrandt

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REDUCING EATING DISORDER RISK FACTORS IN MEMBERS OF A NATIONAL

SORORITY: A TRAIN THE TRAINER APROACH TO DISSEMINATION AND

IMPLEMENATION

Rebecca Greif, PsyD[†1], Thomas Hildebrandt, Psy.D.[1], Carolyn Black Becker, Ph.D.[2]

[1] Eating and Weight Disorders Program, Department of Psychiatry, Mount Sinai School of Medicine, New York, NY USA.

[2] Department of Psychology, Trinity University, San Antonio, TX, USA

[†] Corresponding author. Rebecca Greif, Eating and Weight Disorders Program, Mount Sinai School of Medicine, One Gustave L. Levy Place, Box 1230. New York, NY 10029. Phone: 212-659-8759. Fax: 212-849-2561   Email: rebecca.greif@mssm.edu.

Abstract

Objective: Impediments limit dissemination and implementation of evidence-based interventions (EBIs), including lack of sufficient training. One strategy to increase implementation of EBIs is the train-the-trainer (TTT) model. The Body Project is a peer-led body image program that reduces eating disorder (ED) risk factors. This study examined the effectiveness of a TTT model at reducing risk factors in Body Project participants. Specifically, this study examined whether a master trainer could train a novice trainer to train undergraduate peer leaders to administer the Body Project such that individuals who received the Body Project (i.e., participants) would evidence comparable outcomes to previous trials. We hypothesized that participants would evidence reductions in ED risk factors, with effect sizes similar to previous trials. Method: Utilizing a TTT model, a master trainer trained a novice trainer to train undergraduate peer leaders to administer the Body Project to undergraduate women. Undergraduate women aged 18 years or older who received the Body Project intervention participated in the trial and completed measures at baseline, post-treatment, and five-month follow-up. Primary outcomes included body dissatisfaction, thin ideal internalization, negative affect, and ED pathology. Results: Participants demonstrated significant reductions in thin ideal internalization, ED pathology and body dissatisfaction at post-treatment and 5-month follow-up. At 5 months, using three different strategies for managing missing data, effect sizes were larger or comparable to earlier trials for 3 out of 4 variables. Discussion: Results support a TTT model for Body Project implementation and the importance of utilizing sensitivity analyses for longitudinal datasets with missing data.

Reducing Eating Disorder Risk Factors: A Pilot Effectiveness Trial of a Train-the Trainer

Approach to Dissemination and Implementation

Research efforts have significantly increased the number of available evidence-based

interventions (EBIs) for mental health conditions. Research, however, also indicates that EBIs

are not commonly utilized in clinical settings[1,2] due to a number of factors including lack of

highly trained professionals and challenges in providing adequate clinical training to those with

less background in a given intervention[2,3]. Currently, the standard model of post-graduate school

clinical training involves attending a workshop led by an "expert" clinician coupled with reading

a treatment manual. This model has several impediments: there are a limited numbers of

"expert" clinicians who can train others in EBIs, expert clinicians are costly to employ[4], and

research indicates that this form of training increases therapist knowledge but does not improve

therapist competency or clinical behavior[5,6].

Due to limitations of current training models, researchers increasingly are investigating

different methods aimed at effectively training clinicians in EBIs on a large scale. One method

that has gained increasing attention, a train the trainer approach (TTT), involves an expert trainer

who teaches identified non-expert individual(s) how to administer an intervention as well as how

to train others to implement the intervention[6]. TTT is designed to address several of the

limitations to traditional training models by teaching a larger pool of less expensive providers to

train others in EBIs, which also increases the availability of local post-training supervision.

Although there is a general dearth of research regarding TTT[7], preliminary research suggests

TTT is an effective training approach for a few different types of psychological interventions,

including a guided self help version of cognitive behavioral therapy for binge eating behavior[8]

and motivational interviewing techniques[9]. Additional research regarding TTT, however, is

critical to the advancement of mental health training procedures and improved dissemination of

EBI's.

The Body Project, an empirically supported body image program conducted in a group

format, has been shown to reduce both eating disorder (ED) risk factors and the risk of ED onset

relative to assessment only control[10]. The Body Project is based on the dual pathway model of

bulimia nervosa[11] which posits that sociocultural pressures to be thin and investment in the thin-

ideal (i.e., thin-ideal internalization) lead to body dissatisfaction. Body dissatisfaction then

theoretically contributes to increases in dieting and negative affect which in turn can lead to

onset of ED behaviors in vulnerable individuals[11]. Consistent with the theory of cognitive

dissonance[12], the Body Project centers on encouraging participants to engage in behaviors that

actively challenge the thin-ideal which should, in turn, lead to a decline in thin-ideal

internalization and a subsequent reduction in the other ED risk factors.

The Body Project is supported by a significant efficacy and effectiveness evidence base[13-17,18,19, 20, 21,22, 23-25, 26,27, 28]. Though other ED prevention programs, such as the Health Weight

Intervention[10] and Student Bodies [29]are also empirically supported, The Body Project is the

program with the largest research base, including independent replication[30]. More specifically,

repeated trials indicate that the Body Project reduces body dissatisfaction, thin-ideal

internalization, dietary restraint, bulimic pathology, and negative affect with many changes

largely maintained through 12-36 month follow-up[10,17,28,31,32]. As noted above, research also

indicates that the Body Project reduces the risk of ED onset relative to assessment only control[10].

It is important to highlight, however, that this finding is not unique to the Body Project. More

specifically, both the Body Project and the Healthy Weight program have yielded comparable reductions in eating disorder onset relative to assessment only control[10]. The Healthy Weight program has also produced comparable reductions in risk factors in both efficacy and effectiveness trials[10,17].

As The Body Project has evolved, dissemination of the program has relied on a number of strategies described in the literature to improve scalability of psychological interventions (i.e., the degree to which implementation of an intervention can be "scaled up"[33,34]). For instance, in its original form, the program was administered to groups of participants by a doctoral level psychologist; however it was subsequently task-shifted[33,34] from very or moderately expensive group leaders (i.e., doctoral or masters level providers) to less expensive group leaders (e.g., undergraduate peers). A number of studies support the viability of this scaling strategy with the Body Project[14,15,17,28]. As part of this task-shifting approach, training procedures were developed in which a doctoral level psychologist directly trained undergraduate peer leaders to administer the program. During these standardized intensive training workshops, peer leaders conducted role-plays of simulated sessions and received feedback from the doctoral level trainer to ensure they reached an adequate level of competency.

This task-shifting dissemination strategy was used to implement the program at several universities across the country; however, it soon became clear that there were limitations to this approach. More specifically, a dearth of competent trainers, the inability of these few trainers to travel to universities around the country secondary to demands from their main source of employment, and the significant expense of hiring doctoral level trainers were impediments to broader dissemination of the program. It was determined that a TTT model, in which a highly

experienced doctoral level psychologist (i.e., master trainer) would train non-expert providers

(i.e., novice trainers) to subsequently train undergraduate peer leaders, might alleviate these

impediments and therefore be advantageous. This approach was subsequently implemented in

two manners.

The first attempt at implementing a TTT model for The Body Project involved a pilot

study in which consultants from Tri Delta (a national sorority)[1] were trained to implement the

program by a master trainer and then were deployed to train undergraduate peer leaders at an

individual sorority chapter[31]. Results from this pilot study indicated that ED risk factors were

reduced; however, effect sizes and number of participants who completed the program were

lower than in previous trials.

The second attempt at implementing a TTT approach was conducted at a centralized

training program created for The Body Project, known as the Body Image Academy (BIA). BIA

involved an intensive 2-day training experience in which undergraduates from institutions across

the country were trained to be peer leaders (referred to as "Track 1";see Kilpela et al[35] for a

detailed description of Track 1). BIA also involved a "Track 2" which targeted university

professionals (e.g., faculty, dieticians, staff from counseling centers, and others). During BIA,

university professionals simultaneously were trained-to-train the undergraduate students in BIA

Track 1 with the expectation that they then would be competent to train undergraduate peer

leaders back at their home institutions. The TTT model used in Track 2 at BIA was based on

significant clinical experience with training but had not been studied. Thus, we lacked clear data

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[1] A National Sorority is a national society or club for undergraduate women. A Sorority Chapter
is a campus-based organization of a National Sorority.

that demonstrated whether or not the Body Project retained its effectiveness at a participant level

when peer leaders were trained by trainers who had participated in a 2-day TTT training.

The primary aim of the present pilot study was to investigate the degree to which a

specific 2-day TTT model would produce participant outcomes (i.e., effectiveness) comparable

to previous controlled trials of the Body Project. Proctor et al.[36] note that there are

multiple levels of outcomes that can be explored in dissemination/implementation research, and

offer a taxonomy that includes: implementation outcomes (e.g., adoption, fidelity), service

outcomes (e.g., efficiency, effectiveness), and client outcomes (e.g., satisfaction, function). In

this trial, we sought to investigate the primary service outcome that university professionals

reported to us was the most important to them, namely effectiveness. Effectiveness refers to the

degree to which the program produces desired outcomes with participants. Thus, in this trial we

examined whether a novice trainer who was trained by a master trainer over a 2-day period could

train undergraduate peer leaders to administer the Body Project and yield comparable

effectiveness outcomes to previous trials of The Body Project[15,17,31] using a benchmarking

approach[37,38]. We operationalized effectiveness as reductions in participant-level ED risk factors

assessed in previous controlled research. We hypothesized that participants would evidence

significant reductions in ED risk factors, and that effect sizes would be similar to previous trials

of The Body Project.

Methods

Participants

The Body Project was implemented with members of a national sorority (i.e., a women's

social organization at an undergraduate institution) in a large university in the Northeastern

portion of the United States who were 18 years or older. Sorority members could volunteer to be

trained as peer leaders or participate in the 2-session group program.

Because the sorority chapter chose to strongly encourage participation in the Body

Project (either as a peer leader or a participant) the program and study were separated from one

another. More specifically, sorority members could complete The Body Project groups and elect

not to be participants in this study. The study consisted of completion of the assessments, and

only was conducted on individuals who received the Body Project as participants (i.e., peer

leaders were not included in this study). Of the 124 sorority members who were eligible to

receive the Body Project (i.e., all members of the sorority except those who volunteered to be

peer leaders), 72 members participated in the Body Project between Spring 2009 and Spring

2010 and all members who participated in the program also consented to the research study and

completed the baseline assessment (T1). Women who met criteria for an ED (n=8) were

removed from analyses, resulting in a total sample of 64 participants. Of the 64 participants, 46

(71.9%) completed the second session of The Body Project and all members who completed the

second session also completed the post-treatment assessment (T2). Twenty-eight (43.8%)

participants completed 5-month follow-up assessments (T3). See Figure 1.

Procedures

In September 2008, prior to the commencement of The Body Project, members of the

sorority attended a sorority chapter meeting where the content and history of the Body Project

was discussed. The peer-led nature of the program was also explained. Sorority members then

had the opportunity to volunteer to be trained as a peer leader or to be a participant in the Body

Project.   All members of the sorority were encouraged to volunteer either as a peer leader or

participant; however, this was not mandatory. As noted above, the research study and The Body

Project were maintained separately. At this meeting, the voluntary research study, which was for

participants only (i.e., not peer leaders) also was explained. Sorority members were informed

that they could receive The Body Project without taking part in the study.

This study commenced in March 2009 and data were collected through Spring 2010. The

study and The Body Project program were approved by the sorority president, the University

Greek Council (a governing body that oversees sorority activities on campus), and the University

Institutional Review Board. A member of the sorority, referred to as the Body Image

Coordinator, was appointed to serve as a liaison between the research team and the sorority.

Sorority members who agreed to participate in the study in Spring 2009 (n=49)

completed the consent form and baseline questionnaires (see "Measures" section, below) directly

prior to the first Body Project session. Members generated their own ID numbers so that data

would be anonymous. Participants completed post-treatment questionnaires directly after

completion of the second Body Project session; they also completed five-month follow-up

questionnaires at a sorority meeting. We audio taped Body Project sessions to assess peer leader

adherence to the treatment protocol.

After the sorority's initial implementation of The Body Project in Spring 2009 sorority

officers decided to implement the program each semester with new sorority members. We

trained new peer leaders using the same TTT training protocol to replace peer leaders who had

graduated. Data were collected on Body Project participants who joined the sorority in Fall 2009

(n=11) and Spring 2010 (n=12). This resulted in three cohorts of participants.

Training Procedures. Multiple peer leader trainings occurred in the context of this trial.

The first 2- day training workshop (i.e., Trainer Training) occurred in Fall 2008 in which the a

master trainer simultaneously trained several graduate students, including the first author, as

Body Project trainers and trained undergraduate peer leaders. This training was similar to the trainings that occurred at BIA with the graduate students serving in the role previously occupied by university professionals. The next training workshop (i.e., Peer Leader Training) occurred in Winter 2009 in which the first author, who was now a trainer, trained additional undergraduate peer leaders (i.e., "Peer Leader Training"). Both types of trainings are detailed, below.

Trainer Training.

In October 2008, a master trainer traveled to the research site and conducted a two-day training that mirrored the procedure used in Body Image Academy. This training consisted of two full days. Twelve undergraduate students served as peer leaders in training and the first author and several other graduate students served as trainers in training. The 12 peer leaders were divided into 4 teams of three students and proceeded to take turns leading an abbreviated version session 1 on day 1 and session 2 on day 2, using the highly scripted Body Project manual. After the first team completed their trial of session 1, the master trainer modeled how to give supervision and highlighted common training issues. Supervision involved providing feedback with regard to both content (e.g., forgetting to administer an intervention in the manual) and process (e.g., reflective listening, facilitating conversation among group participants). Subsequently, the graduate students (trainers in training) provided feedback after each team completed the abbreviated version of session 1 and received behavioral supervision on their supervision from the master trainer. On day 2, the same process was repeated. Thus, graduate students were able to practice giving supervision 3 times on each day and received a total of 6 rounds of supervision from the master trainer. Throughout the training, the master trainer also provided clarification and suggestions for handling challenging sections/participants.

Peer leader training. Five additional sorority members who volunteered to be peer

leaders after the aforementioned training attended a separate peer leader training session in

February 2009. The full-day training was led by the first author. During training, each peer

leader team implemented abbreviated program sessions (i.e., 40 minutes instead of 2 hours)

using a Body Project manual, while the other teams acted as participants. Peer leaders received

supervision from the first author regarding their simulated session. Similar to the other training,

supervision involved providing feedback with regard to both content (e.g., forgetting to

administer an intervention in the manual) and process (e.g., reflective listening, facilitating

conversation among group participants). New peer leaders were trained as needed using this

same procedure for the following year.

Body Project. After training was completed, the undergraduate peer leaders

administered the Body Project to groups of sorority women (i.e., participants). The Body Project

consisted of two, 2-hour group sessions administered by two to four peer leaders to groups

consisting of five to nine participants. During the first session, participants identified the thin

ideal, discussed the origin of the thin ideal and how it is perpetuated in our society, discussed the

costs of pursuing the thin ideal, and delineated past situations when they felt pressure to pursue

the thin ideal and how they would currently respond to that pressure. Between the first and

second session participants were asked to stand in front of a mirror and list their positive physical

and emotional qualities. The second session consisted of role-plays in which peer leaders acted

as a "thin idealist" and small groups of participants attempted to challenge their pursuit of the

thin ideal. Participants also discussed ways to challenge common "fat talk statements,"

discussed ways that sorority members can resist the thin ideal both on an individual level and

collectively (i.e., body activism), discussed possible barriers to body activism and how to overcome these barriers, and committed to a self-affirmation homework exercise.

Measures

The primary dependent variables were thin ideal internalization, negative affect, body dissatisfaction, and bulimic pathology.

Thin ideal internalization. Thin ideal internalization was assessed using an 8-item modified version of the Ideal-Body Stereotype Scale-Revised (IBSS-R)[39]. Participants responded to statements such as "Thin women are more attractive" using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Items are summed and then averaged. The IBSS-R has good internal consistency (alpha = .83 to .91), test-retest reliability (r=.67 to .80) and convergent and predictive validity[39,40]. The internal consistency of the IBSS-R in the present study was 0.77 at baseline, 0.86 at post-treatment, and 0.76 at 5-month follow-up.

Negative affect. Negative affect was assessed using the Positive and Negative Affective Schedule (PANAS). Participants reported whether they had experienced 20 negative emotions during the past week using a 5-point Likert scale ranging from 1 (not at all) to 5 (extremely). PANAS has demonstrated good internal consistency (α = .95), reliability and validity[41]. The internal consistency of the PANAS in the present study was 0.91 at baseline, 0.94 at post-treatment, and 0.97 at 5-month follow-up.

Body dissatisfaction. Body dissatisfaction was assessed using the Satisfaction and Dissatisfaction with Body Parts Scale (SD-BPS)[42]. Participants rated their dissatisfaction with nine body parts (e.g. stomach, thighs, hips) using a Likert scale ranging from 1 (extremely satisfied) to 5 (extremely dissatisfied). This scale has good internal consistency (α = .94), 3-

week test-retest reliability ($r=.90$) and predictive validity for bulimic symptom onset[23]. The

internal consistency of the Satisfaction and Dissatisfaction with Body Parts Scale in the current

study was 0.95 at baseline, 0.92 at post-treatment, and 0.94 at 5-month follow-up.

Bulimic pathology. Bulimic pathology was assessed using the bulimic composite score

of the Eating Disorder Examination-Questionnaire (EDE-Q)[43] which assesses eating behaviors

and attitudes over the past 28 days (e.g., "Over the past 28 days how many times have you made

yourself sick (vomit) as a means of controlling your shape or weight?"). The EDE-Q is a self-

report version of the Eating Disorder Examination (EDE)[44], a semi-structured interview used to

assess EDs. The EDE-Q has good test-retest reliability ($r=0.81$ to 0.94) and internal consistency

($\alpha = .78$ to 0.93)[45,46]. The bulimic pathology subscale was derived by summing the diagnostic

items of the EDE-Q and then computing an average score. The internal consistency of this

subscale was 0.80 at baseline, 0.78 at post-treatment, and 0.72 at 5-month follow-up.

Statistical Analyses

Given the relatively high rate of participant dropout, we utilized three different statistical

models for analyzing missing data in the context of this longitudinal study. There is currently no

empirical basis for choosing one statistical model versus another and therefore researchers have

suggested the use of sensitivity analyses, such as the one used in this study, which fit multiple

statistical models to the same data[47]. MAR models are based on the assumption that the

likelihood of missing data on variable Y (e.g., thin ideal internalization, TIIS) is not related to the

unobserved values of Y (e.g., missing values for TIIS), though they may be related to other

variables in the analysis[48,49]. In contrast, MNAR models posit that there is a relationship

between the outcome variable and the likelihood of missing data. The Diggle Kenward model

consists of a growth curve model plus a regression equation that predicts the probability of

missing data at a specific timepoint based on the repeated measures variable (Y). This model

also assumes a normal distribution for Y, which seems reasonable based on the dependent

variables in this study, yet is impossible to test. The Pattern Mixture Model stratifies a study

sample into subgroups that have similar missing data patterns and subsequently estimates

separate growth models for each pattern. This model assumes homogeneity of growth within

each group.

Analysis of intervention effects was conducted using latent growth curve modeling[50].

All analyses were conducted using Mplus 6.12[51]. Linear and non-linear models were compared

to establish the best fit for the data utilizing a missing at random (MAR) model for missing data.

The best fitting model was determined using comparative fit index (CFI) and root mean square

of approximation (RMSEA). CFI values >0.95 and RMSEA values <0.06 were considered

evidence for a good model fit to the data[52]. Separate latent growth curve models for each of the

four dependent variables at three time points (i.e., baseline, post-treatment, and 5-month follow-

up) were constructed using a non-linear spline to estimate deceleration of change over follow-up.

Analyses also were conducted using two missing not at random models (MNAR): the Diggle-

Kenward[53] which is one type of Selection Model and the Pattern Mixture Model[54]. The purpose

of this sensitivity analysis was to compare effect sizes and changes in treatment based on

different models for missing data.

All Body Project sessions were audio-recorded and fifty percent of tapes were coded by

the first author for adherence to the intervention manual. An adherence measure was used which

lists specific tasks that peer facilitators were intended to implement (e.g., discussed origins of the

thin ideal and elicited sources such as media, fashion industry, weight loss industry). Each task

was rated on a 4-point Likert scale which ranged from 0 (did not complete) to 3 (fully

completed). All coded tapes exhibited strong adherence to the treatment protocol.

Comparison Studies.

As this was a benchmarking study, results from this trial were compared to the results

from three previous trials of The Body Project (Becker et al., 2008, Perez et al., 2010, Becker et

al 2010). Each of these studies is described, in turn. In Becker et al. (2008), 188 sorority

members were randomized to receive The Body Project or an intervention referred to as Media

Advocacy, which was identical to The Body Project except it excluded the dissonance-inducing

activities. All peer leaders were undergraduate sorority members trained by the master trainer

who developed the peer lead version of this program. Initial participation rates were strong

(92%) as well as retention rates at post-intervention (90.5%), seven week follow-up (87.3%) and

eight month follow up (74.5%). In a second study, Perez and colleagues (2010) examined

whether The Body Project could be implemented on a semi-mandatory basis at a large state

university with TriDelta members using the aforementioned TTT model in which consultants

from Tri Delta (a national sorority) were trained to implement the program by a master trainer

and then were deployed to train undergraduate peer leaders at an individual sorority chapter.

One hundred and eighty four members of Tri Delta participated in this program and evidenced

reduced rates of participation at post-treatment (79.1%) and one year follow up (62.6%)

compared to previous trials. Finally, Becker and colleagues (2010) compared The Body Project

to a modified version of the Health Weight Prevention program (MHW), which is another

empirically supported ED prevention program. Peer leaders were undergraduates trained by

same master trainer as in the previous studies. One hundred and six sorority members were

randomized to The Body Project or MHW and initial participation rates (97%) and retention

rates were strong at post-treatment (98.1%) , eight week follow up (81%(, eight month follow-up (81%) and 14-month follow up (74%).

Results

Sample Characteristics

Of the 72 women who participated in the study, eight participants were excluded because they met criteria for a current ED. This resulted in a final sample of 64 participants with a mean age of 19.86 (SD = 1.32). Participants' mean body mass index (BMI), based on self-reported height and weight, was 25.38 (SD = 4.85) with a range from 17.33 to 36.90. Note that one participant with a BMI of 17.33 did not endorse any shape or weight concerns and was therefore not excluded from the study despite being underweight. The majority of participants identified their ethnicity as Caucasian (78.1%). The remainder of participants identified themselves as Hispanic (12.5%), Asian (4.7%), Black (1.6%) and "Other" (3.1%). The grade level of participants was as follows: 34.4% were in their sophomore year of college, 25% were juniors, 18.8% were seniors, and 17.2% were freshman.

T-test analyses did not reveal statistically significant differences on participants' baseline scores on thin ideal internalization, negative affect, body dissatisfaction, bulimic pathology, and BMI between cohort 1 (i.e., Spring 2009) cohort 2 (i.e., Fall 2009), or cohort 3 (i.e., Spring 2010). Analyses were also conducted to determine if there were predictors for dropout at T2 or T3. Logistic regression analyses did not identify any predictors of dropout at end of treatment (See Table 1) or 5-month follow-up (See Table 2).

Primary Outcomes

Table 3 consists of the estimated model means, standard deviations, intercept and slope for the four dependent variables (thin ideal internalization, negative affect, body dissatisfaction, and bulimic pathology) at all three time points (baseline, post-treatment, and 5- month follow-up) for all three analytic models (Missing at Random, MAR; Diggle-Kenward, DK; Pattern Mixture Model, PMM). The slope for all three models indicate that there was significant reduction in participants' level of thin ideal internalization (IBSS-R), body dissatisfaction (SD-BPS) and Bulimic Pathology (EDEQ-BN) from baseline to 5-month followup. The slope for all three models of PANAS indicates that there was not a significant change in the level of participants' negative affect from baseline to 5-month follow-up.

The effect sizes of this study and the effect sizes found in Becker et al. (2008), Becker et al. (2010), and Perez et al. (2010) are listed in Table 4. Reduction in thin ideal internalization at 5-month follow-up in this study was larger than in previous trials and the effect size for reduction in bulimic pathology and body dissatisfaction were comparable to previous trials. Reductions in negative affect were not significant.

Sensitivity Analyses

The three analyses resulted in significant differences with regard to effect sizes (see Table 4). With the exception of body dissatisfaction, PMM analyses resulted in lower estimates of effect sizes relative to the other two models. In general, the three analyses did not yield significant differences with regard to model slope. One exception is that the estimated slope for EDEQ-BN was comparatively higher using DK analyses [$\mu_{slope} = -0.427$ (*SE*=0.106)] and PMM analyses [$\mu_{slope} = -0.431$ (*SE*=0.106)] as compared to MAR analyses [$\mu_{slope} = -0.228$ (*SE*=0.060].

Discussion

The primary aim of this dissemination study was to investigate whether or not the Body Project retained effectiveness when a 2-day TTT approach was used to train novice trainers of peer leaders. More specifically, this study examined whether individuals who participated in the Body Project Program, led by peer leaders who were trained by the novice trainers, would evidence significantly reduced key ED risk factors and yield effect sizes comparable to previous controlled trials of the Body Project using a benchmarking approach. Benchmarking involves comparing effect sizes across trials so that less controlled trials (e.g., when research moves from efficacy through effectiveness to dissemination) can be compared to more controlled trials[37] Consistent with the study's hypotheses, participants demonstrated significant reductions in thin ideal internalization, bulimic pathology and body dissatisfaction at post-treatment and 5-month follow-up, though there was a trend toward increased scores from post-intervention to follow up. We should note that given the reduced rates of participation and study retention, it is difficult to make strong conclusions based on the results of this study. Nonetheless, at 5 months, using three different strategies for managing missing data, effect sizes were either larger or comparable to earlier trials for 3 out of 4 variables (thin-ideal internalization, body dissatisfaction, and ED pathology). Importantly, these are the three most salient variables and are most directly targeted by the Body Project.   Moreover, recordings of Body Project sessions support that peer leaders, trained using this TTT approach, exhibited strong adherence to the intervention protocol. Although this was not a primary outcome of this study, it provides some additional support for the TTT approach.

Although one must be cautious in drawing conclusions from this pilot study given the relatively low retention rates, relatively high rates of participant dropout, and absence of a control condition, taken as a whole, results appear to provide preliminary support for the

effectiveness of a 2-day TTT model for the Body Project. This is important both for the TTT

model generally and for dissemination of the Body Project specifically. Considering the TTT

strategy, this study provides further support for this model of increasing scalability of EBIs by

training lower cost providers to train other providers. In turn, this increases the number of

individuals who can be properly trained in these interventions, which increases the number of

individuals reached as program participants.

In terms of the Body Project specifically, these results provide preliminary empirical

support for one of the training methods that has been used in the Body Project dissemination

efforts. Further, although the BIA is no longer in existence we have continued to use the two-

day TTT approach to facilitate ongoing dissemination of the Body Project. As in the present

study, this usually involves sending a master trainer to a university to train both trainers and peer

leaders. These dissemination efforts have resulted in significant positive qualitative feedback as

well as reports from universities that their own internal assessment (using benchmarking)

supported the approach. However, this is the first study that directly tested this specific Body

Project TTT dissemination model.

This study highlights the importance of how one handles missing data in the context of a

longitudinal prevention program, particularly given that predictors of dropout were difficult to

identify. The three different types of analyses conducted in this trial yielded different results and

PMM analyses yielded outcomes most consistent with previous trials of The Body Project.

Sensitivity analyses, such as the ones conducted in this study, are therefore particularly valuable

because they provide the ability to better understand variable outcomes. For instance, in this

study, a more conservative effect was found when missingness was considered a pattern within a

subgroup. In larger trials with more observation timepoints, PMM analysis may enhance our nuanced understanding of how symptom change over time is related to dropout.

Limitations

There are several limitations to this study. The reduced rate of program participation coupled with the relatively high rate of participant dropout in this study (i.e., twenty nine out of the seventy two participants in the study completed follow up assessments) makes it difficult to draw strong conclusions about the effectiveness of the TTT model because it is unknown how members who did not participate in, or dropped out early from, the study would have responded to The Body Project. The sample size is also small which reduces statistical power. The follow-up period of 5 months is also relatively short for a prevention program. Moreover, the mean BMI was 25, which is the high end of a healthy BMI range; this may reflect a biased sample. In addition, there was no control group and therefore it is possible that the results are due to factors that are not associated with The Body Project. For example, it is possible that demand effects impacted participant ratings on outcome measures. However, previous studies of cognitive dissonance interventions used waitlist conditions[23] and comparison of the results obtained in this study with previous waitlist conditions support the effectiveness of The Body Project. For instance, 5 month effect sizes in the present study (e.g., bulimic pathology $d = .45-.62$) largely benchmarked against the 6-month Body Project results from Stice et al.'s[23] highly controlled efficacy trial (bulimic pathology $d = .56$), in which the Body Project yielded superior results to both an assessment only control and expressive writing control condition at 6 months.

Conclusion

In summary, this study suggests that a train-the-trainer model is largely effective for dissemination of the Body Project program. Three different types of data analysis were utilized

in this study and confirm these findings. However, these results should be interpreted with

caution given the low rates of program participation and retention and absence of a control

condition. Future research should further examine how a train-the-trainer model can be used to

further disseminate the Body Project as well as other psychological interventions. Moreover,

sensitivity analyses should be utilized more frequently with longitudinal datasets involving

missing data.

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Eligible Participants (n = 124)

Enrollment: Open Trial (n = 72)

Intervention:

Received 1st intervention session only (n = 72)

Received complete intervention (n = 48)

Follow-up:

Completed follow-up (n = 28)

Analysis:

Completed all assessment time points (n = 28)

Missing Data Analysis for ITT, n = 44 (72-28)

Excluded from analysis, n = 8

Reason: Met criteria for likely eating disorder

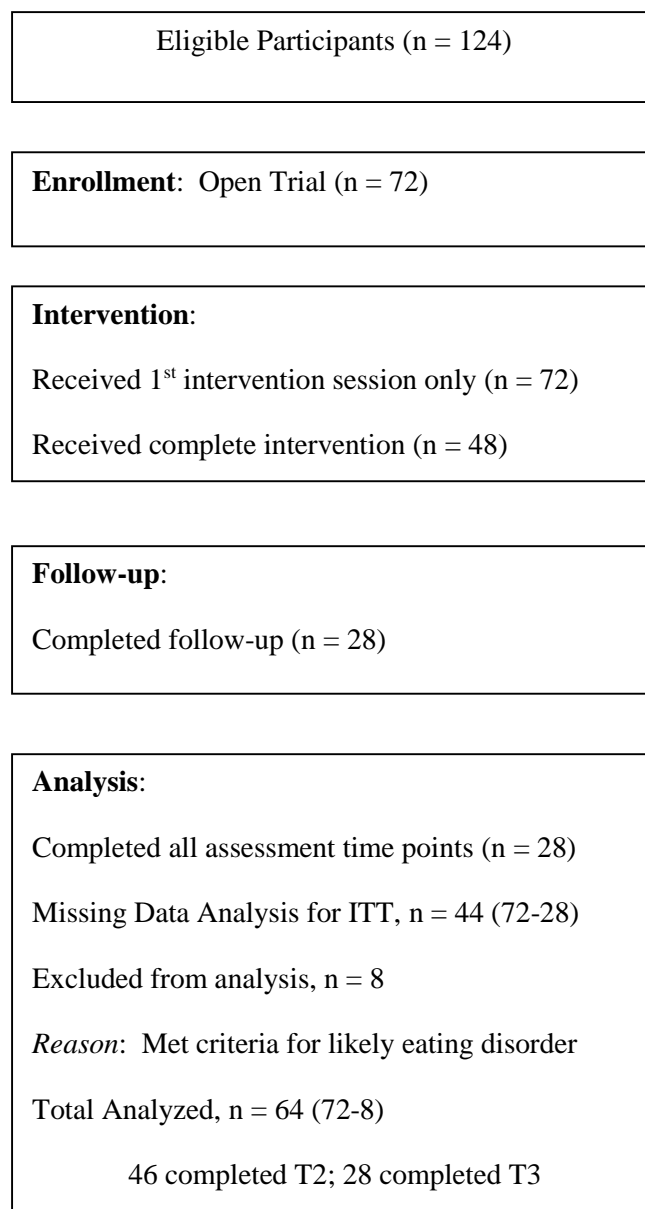Total Analyzed, n = 64 (72-8)

46 completed T2; 28 completed T3

Figure 1. Consort flowchart showing participant movement through study.

Table 1

Summary of Logistic Regression Analysis for Variables Predicting Dropout at End of Treatment

Predictor of End of Treatment Dropout	B	$SE\ B$	e^B
Baseline TIIS	-0.061	0.617	0.941
Baseline PANAS	0.686	0.568	1.461
Baseline SD-BPS	-0.145	0.370	0.865
Baseline EDEQ-BN	-0.496	0.451	0.609
Baseline BMI	-0.013	0.075	0.987
Constant	-0.539		
χ^2		3.466	
df		5	

Note: e^B = exponentiated *B*. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 2

Summary of Logistic Regression Analysis for Variables Predicting Dropout at 5-Month Followup

Predictor of 5-Month Followup Dropout	*B*	*SE B*	e^B
Baseline TIIS	-0.061	0.654	0.418
Baseline PANAS	-0.756	0.629	0.470
Baseline SD-BPS	0.228	0.450	1.257
Baseline EDEQ-BN	0.508	0.546	1.662
Baseline BMI	-0.032	0.073	0.968
Change in TIIS Score[+]	0.028	0.523	1.029
Change in PANAS Score[+]	0.079	0.589	1.083
Change in SD-BPS Score[+]	0.495	0.582	1.640
Change in EDEQ-BN Score[+]	1.035	0.796	2.816
Constant	4.607		
χ^2		8.987	
df		9	

Note: e^B = exponentiated *B*. *$p < .05$. **$p < .01$. ***$p < .001$.

[+]= change in score from baseline to end of treatment.

Table 3

Estimated Model Means and Standard Deviation for Dependent Variables

	Measure	Baseline M(SD)	Post-Tmt M(SD)	5-Mo FU M(SD)	Intercept (SE)	Slope (SE)
Missing At Random	IBSS-R	3.61 (0.49)	3.12(0.58)	3.27(0.52)	**3.608 (0.061)***	**-0.486 (0.089)***
	SD-BPS	3.35 (1.01)	3.04(0.86)	3.13(1.01)	**3.348 (0.127)***	**-0.313 (0.116)****
	PANAS	1.82 (0.55)	1.67 (0.58)	1.72(0.81)	**1.819 (0.068)***	-0.147 (0.092)
	EDEQ-BN	1.36(0.84)	0.96(0.67)	1.00(0.73)	**1.348 (0.105)***	**-0.228 (0.060)***
Diggle Kenward	IBSS-R	3.61(0.52)	3.05 (0.77)	3.11(0.69)	**3.706 (0.088)***	**-0.400 (0.104)***
	SD-BPS	3.35 (1.10)	2.967(1.04)	3.005(1.19)	**3.392 (0.193)***	**-0.328 (0.078)*****
	PANAS	1.82(0.65)	1.74(0.68)	1.75(0.87)	**1.949 (0.098)***	-0.184 (0.117)
	EDEQ-BN	1.36 (0.86)	0.94(0.78)	0.98(0.84)	**1.375 (0.148)***	**-0.427 (0.106)***
Pattern Mixture Model	IBSS-R	3.61(0.53)	3.08(0.81)	3.13(0.73)	**3.700(0.090)***	**-0.397 (0.105)***
	SD-BPS	3.35(1.06)	2.98(0.97)	3.02(1.04)	**3.415 (0.185)***	**-0.338 (0.143)*****
	PANAS	1.82(0.62)	1.72(0.63)	1.73(0.84)	**1.924 (0.099)***	-0.168 (0.118)
	EDEQ-BN	1.36(0.83)	0.94(0.75)	0.98(0.81)	**1.386(0.147)***	**-0.431 (0.106)***

Note. *p<0.001;** p<0.01; ***p <0.05

Table 4
Comparisons of Current Study with Previous Research

Measure	Post-treatment			5-Month Follow-up			Comparison Studies		
	Cohen's *d* MAR	Cohen's *d* DK	Cohen's *d* PMM	Cohen's *d* MAR	Cohen's *d* DK	Cohen's *d* PMM	Cohen's *d* 5-Mo FU Perez et al. (2010)	Cohen's *d* 8-Mo FU Becker et al. (2008)	Cohen's *d* 8-Mo FU Becker et al. (2010)
IBSS-R	0.73	0.81	0.63	0.69	0.79	0.60	0.21	0.40	0.30
SD-BPS	0.63	0.48	0.51	0.28	0.35	0.44	0.24[1]	0.37[1]	0.59[1]
PANAS	0.43	0.12	0.12	0.16	0.08	0.10	N/A	N/A	0.35
EDEQ-BN	0.74	0.72	0.51	0.62	0.58	0.45	0.41	0.37	0.55

Note: 1 A different measure was used to assess body dissatisfaction in these studies. MAR = Missing at random model.

DK = Diggle-Kenward Model. PMM = Pattern Mixture Model