

Regular article

A gender-specific approach to improving substance abuse treatment for women: The Healthy Steps to Freedom program

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Abstract

Given that women increasingly report using drugs to lose weight, substance abuse treatment programs must include body image, weight, eating pathology, and health knowledge as core intervention targets. This study tested the efficacy of a supplemental health and body image curriculum designed for women in substance abuse treatment who report weight concerns called Healthy Steps to Freedom (HSF). Data from 124 adult women recruited from substance abuse treatment facilities in southern Nevada completed measures of drug use, body dissatisfaction, eating pathology, thin-ideal internalization, and health knowledge/behaviors before and after participation in the 12-week HSF program. Results revealed that thin-ideal internalization, body dissatisfaction, and eating disorder symptoms significantly decreased after HSF program participation, whereas health-related behaviors (e.g., increased healthy food consumption) and knowledge (e.g., understanding of basic nutrition, exercise) increased. These results suggest that the inclusion of the HSF program in substance abuse treatment improves weight-related issues in substance-abusing women. © 2012 Elsevier Inc. All rights reserved.

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1. Introduction

Drug use and abuse is an ever-increasing problem for women in the United States (Governors Working Group on Methamphetamine Use [GWG], 2007; Brady & Ashley, 2005; Greenfield et al., 2007). In 2009, an estimated 6.1% of the U.S. female population was classified with substance dependence or abuse in the past year based on criteria specified in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association [APA], 2000)*. Recent estimates suggest that rates of drug use among adolescents are higher in girls than in boys (7.4% compared with 6.7%; SAMHSA, 2010a; Johnston, O'Malley,

Bachman, & Schulenberg, 2009). Furthermore, in 2008, women accounted for over 32% of substance abuse treatment admissions ($n = 649,177$; Substance Abuse and Mental Health Services Administration [SAMHSA], 2010b).

Although understudied to date, at least one reason for the increasingly high rates of drug abuse in women is related to weight concerns: Women increasingly report weight loss as a primary reason to use legal and illegal drugs (Brecht, O'Brien, von Mayrhauser, & Anglin, 2004; Greenfield et al., 2007; Joe, 1995; Joe, 1996; Office of National Drug Control Policy [ONDCP], 2008). For example, a study examining methamphetamine use in a sample of 350 adults found that women were five times as likely to attribute initial drug use to a desire to lose weight compared with men (Brecht et al., 2004). Similarly, in a sample of 3,305 high school seniors, female cigarette smokers reported significantly greater use of diet pills and amphetamines to lose weight than nonsmoking females (Gritz & Crane, 1991). In a

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sample of 290 incarcerated adult women, body image disturbance and preoccupation with thinness was associated with a history of substance abuse (Olson et al., 2005). Given these data, it is essential that substance abuse treatment programs include body image, weight, and eating pathology as core intervention targets to prevent relapse. The purpose of this study was to test the efficacy of Healthy Steps to Freedom (HSF), a health and body image curriculum designed for women in substance abuse treatment who report weight-related issues (Hien, Cohen, Miele, Litt, & Capstick, 2004; Lindsay & Velasquez, 2009; UCLA Integrated Substance Abuse Programs; Welle, Falkin, & Jainchill, 1998).

2. Western culture, weight-loss, and drug use in women

Given that weight loss appears to be a highly motivating and reinforcing side effect of drug use for women (Joe, 1996), one class of drugs that women are abusing at increasingly high rates is stimulants (SAMHSA, 2010b). Stimulants include methamphetamine, cocaine, nicotine, ecstasy, and a number of prescription drugs used to treat various health problems (e.g., dextroamphetamine, also known as Adderall; methylphenidate, also known as Ritalin; National Institute on Drug Abuse [NIDA], 2009). Stimulants are ideal for weight loss because common side effects of their use include increased energy, elevated mood, elevated metabolic functioning, and loss of appetite (Brecht et al., 2004; Greenfield et al., 2007; Joe, 1995; Joe, 1996; ONDCP, 2008). In a study examining 2008 treatment admissions records, for example, 42.7% of individuals endorsing stimulants as the primary substance of abuse were women (SAMHSA, 2010b).

Furthermore, certain classes of stimulants appear to be particularly appealing to women, such as methamphetamine (Gonzales, Mooney, & Rawson, 2010; SAMHSA, 2010a). For example, adolescent girls are more likely to use methamphetamine than boys (Gonzales, Ang, McCann, & Rawson, 2008; Rawson, Gonzales, McCann, & Obert, 2005), and, according to a recent report published by the ONDCP, more than 12% of adolescent girls living in Nevada reported a history of methamphetamine use (ONDCP, 2008). In fact, the weight loss side effects of stimulants like methamphetamine are so strong that they are sometimes used to treat severe exogenous obesity in forms like Desoxyn (methamphetamine hydrochloride; see Food and Drug Administration [FDA], 2007). However, given that most stimulants have a very high potential for abuse, their use to treat obesity is recommended only as a last resort when alternative therapies have been ineffective (FDA, 2007).

Although it may seem surprising that women are using (often illegal) drugs to lose weight, this finding makes sense when considered in the cultural context of the United States. In Western cultures, which broadly refers to first-world societies such as the majority culture in the United States, considerable value is placed on physical appearance as a central determinant of social standing, desirability, and personal worth for women

(Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). The ideal physical appearance is a very thin yet curvaceous, feminine body with flowing hair, a narrow waist, light eyes, large breasts, and long legs (Harrison, 2003; Thompson et al., 1999). Eating disorder researchers argue that these cultural characteristics predispose women to engage in numerous unhealthy behaviors in an attempt to attain the thin-ideal appearance, including drug use (Linehan et al., 1999; Nichter, Ritenbaugh, Nichter, Vuckovic, & Aickin, 1995; Stice, Ng, & Shaw, 2010; Thompson et al., 1999).

3. Weight, body image, and eating-related substance abuse treatment targets

Given the increasing commonality of drug use motivated by weight loss in women, it is essential that substance abuse treatment programs address weight, body image, and eating-related concerns as core intervention targets to prevent relapse. This is particularly critical for women entering treatment for stimulant use because weight gain is anticipated over the course of treatment as the weight-loss side effects of drug use are removed from the body (Brecht et al., 2004). In fact, for many women, weight gain in treatment is substantial: A recent study found that within the first 12 weeks of substance abuse treatment, women gained an average of 6.5 lb (Emerson, Amaro, Glovsky, & Nieves, 2009). Similarly, in a study examining the effectiveness of an exercise and nutrition intervention in substance abuse treatment, Hodgkins et al. (2006) found that all participants enrolled in the study gained weight over the course of the 8-week treatment protocol, independent of the type of intervention received. However, weight gain was highest for the control group (who did not receive any nutrition or exercise information and gained an average of 11.1 lb), followed by a group who received nutrition education and aerobic exercise conditioning treatments (who gained 8.2 lb), and an exercise-only condition (who gained 7.5 lb; Hodgkins, Frost-Pineda, & Gold, 2007).

There are at least four primary treatment targets that may greatly improve substance abuse treatment programs for women. The first is to decrease the degree to which women aspire to attain the unrealistic, ultrathin beauty ideals perpetuated in mainstream Western culture. A large body of research suggests that thin-ideal internalization, defined as the extent to which an individual personally strives to look like thin fashion models and media icons, predicts increased eating pathology in women (Stice, 2002; Thompson, van den Bert, Roehrig, Guarda, & Heinberg, 2004; Warren, Gleaves, Cepeda-Benito, Fernandez, & Rodriguez-Ruiz, 2005). Theoretically, decreasing the degree to which unrealistic weight and appearance ideals are personally internalized and adopting more reasonable, healthy body size ideals may assist women in eliminating unhealthy weight-control behaviors (e.g., using drugs to lose weight).

A second core treatment target is to help women feel more satisfied with their physical appearance. Body dissatisfaction, defined as disliking one's physical appearance, is one of the strongest predictors of eating pathology and can motivate extreme measures to decrease body weight (Parkes, Saewyc, Cox, & MacKay, 2008; Stice & Shaw, 2003). For example, body dissatisfaction has been found to predict dieting, binge eating, purging, excessive laxative use, and severe caloric restriction (Stice, 2002). In addition, body dissatisfaction is often associated with low self-esteem, depressive symptoms, increased anxiety, and poor sexual functioning (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006). Developing interventions that assist women in feeling good about their physical appearance and other aspects of their personhood not related to their appearance (e.g., personality, intelligence, occupation, education, family relationships) may reduce substance use and prevent relapse.

A third important treatment target is to decrease more severe eating disorder symptoms (when and if present). This would include addressing issues of binge eating, purging, laxative use, excessive exercise, and extreme restrictive eating. Although not all women who endorse weight loss as a motivator for drug use will have severe eating disorder symptoms, it is likely that women with more eating disorder pathology will abuse weight loss-enhancing drugs like stimulants. For example, in a Canadian sample of high school students, adolescents who used stimulants were more likely to endorse significant eating pathology and a desire to lose weight (Parkes, Saewyc, Cox, & MacKay, 2008). Consequently, this is a critical co-occurring issue to address in treatment where appropriate (George & Waller, 2005; Stice & Shaw, 2003).

A final core treatment target is to increase global health knowledge and behavior. Specifically, increasing women's knowledge about nutrition and physical activity is warranted to help women regain their health over the course of treatment and recovery. This includes increasing women's knowledge about healthy food consumption (e.g., types of foods, quantity), nutrition (e.g., macronutrient content of foods), energy balance (e.g., calories, metabolism), and physical activity. In addition, measuring changes in behavior through both self-report and objective measures of body composition (e.g., body fat [BF] percentage, body weight, body mass index [BMI]) is important to establish realistic weight goals and document changes in behavior over the course of treatment (Ashley, Marsden, & Brady, 2003; Emerson et al., 2009; Wing & Hill, 2001).

4. The HSF program and this study

Taken as whole, data increasingly suggest that targeting thin-ideal internalization, body dissatisfaction, eating pathology, and global health knowledge and behavior for women in substance abuse treatment is important to decrease substance abuse aimed at weight loss, improve overall

health, promote a healthy body image, reduce existing eating pathology, and lessen the likelihood of relapse. Although many programs exist for women in substance abuse treatment, few (if any) address issues associated with weight, body image, or eating-related concerns. To fill this gap, the HSF program was created.

HSF was designed to supplement existing substance abuse treatment programs and consists of 12 lessons designed to be delivered in 90-minute weekly sessions to groups of 6 to 15 women. Classes were conducted similarly in both residential and outpatient settings. Topics covered in the HSF curriculum include substance abuse and women's health; body image and self-esteem; physical activity; weight and body composition; basic nutrition (e.g., macronutrients, reading food labels, portion control); calories and metabolism; eating behaviors and disordered eating; and cognitive distortions related to weight or appearance. In addition to didactic lessons on these topics, women are engaged in discussion, interactive learning activities, and weekly assignments aimed at putting the program material into practice.

Given that HSF was recently developed and has yet to be empirically supported, the overarching goal of this study was to evaluate its efficacy in a sample of women in substance abuse treatment. We predicted that participants would report decreased thin-ideal internalization, body dissatisfaction, and eating pathology and increased health-related knowledge and behaviors following HSF program participation.

5. Method

5.1. Participants

A total of 257 female participants were recruited from seven substance abuse treatment facilities in the southern Nevada area (four outpatient court-ordered, self-referral facilities and three residential court-ordered, self-referral facilities) to participate in the HSF program. Participants included women more than 18 years of age and in treatment for substance abuse. No exclusions were given based on drug of choice, diagnostic categories, or varying degrees of eating pathology. Participants were only excluded if they did not endorse a history of substance abuse (e.g., gambling, sex addiction).

All participants were volunteers and did not receive any compensation for their participation. Of the 257 participants who began the program, 124 completed and were involved in this study. Although this may seem like a high dropout rate, research suggests that approximately 50% of individuals who enter substance abuse treatment drop out within the first month (Ball, Carroll, Canning-Ball, & Rounsaville, 2006) and that dropout rates increase when treating polysubstance abuse (e.g., King & Canada, 2004). Therefore, the attrition rate seen in this study is comparable with existing research on substance abuse treatment retention.

5.2. Measures

Participants completed self-report questionnaires and researcher-collected measures in seven primary domain areas: demographic, anthropometric/physiological, drug use, thin-ideal internalization, body dissatisfaction, eating pathology, and general health behavior and knowledge. Although most measures were completed before and after HSF program participation, some (i.e., demographics and drug use) were only completed before program participation (as noted below).

5.2.1. Demographics (pretest only)

Participants identified their age, race and/or ethnicity, education, history of drug use, length of time in substance abuse recovery, family status (e.g., whether they have children), and weight history (e.g., weight of the participant when she stopped using). Although preferable for researchers to take these measurements, research suggests that self-report of weight tends to be very accurate in adults (Stunkard & Albaum, 1981).

5.2.2. Physical body assessments (pre- and posttest)

Anthropometric/physiological data included height, weight, and body composition. To determine BMI (lb / [in.² × 703]), participants were weighed on a laboratory scale (without shoes) to the nearest 0.5 lb, and height was measured to the nearest 0.25 in. using a stadiometer. In addition, BF percentage was measured using a prediction equation (Jackson, Pollock, & Ward, 1980) based on subcutaneous fat measured from four skinfold sites (abdomen, ilium, tricep, and thigh).

5.2.3. Thin-ideal Internalization (pre- and posttest)

The thin-ideal internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3 THIN-INT; Thompson et al., 2004) estimated internalization of Western cultural ideals of appearance perpetuated in mainstream media. Items are rated on a 5-point Likert-type scale from *completely disagree* to *completely agree*, with higher scores indicating increased internalization of the thin ideal. Psychometric evaluations of the SATAQ-3 indicate strong internal consistency in undergraduate females (Thompson et al., 2004; Forbes, Jobe, & Revak, 2006) and patients with eating disorders (Calogero, Davis, & Thompson, 2004). Previous versions of the SATAQ-3 (e.g., Heinberg, Thompson, & Stormer, 1995) have demonstrated strong internal consistency in adolescent boys and girls (e.g., Karazsia & Crowther, 2008; Knauss, Paxton, & Alsaker, 2009).

5.2.4. Body dissatisfaction (pre- and posttest)

A 16-item (shortened) version of the original Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) is designed to measure general dissatisfaction and preoccupation with one's body shape and

weight (BSQ-16, Scale 2; see Evans & Dolan, 1993). Participants rate how they feel about their body on a 6-point Likert-type scale from *never* to *always*. A sample item is: "Have you felt ashamed of your body?" The 16-item short form used in this study (BSQ-16) has been shown to be a psychometrically sound derivation of the BSQ-34 (Warren et al., 2008), with correlations between the full version and short form ranging from $r = .96$ to $r = .99$ (Evans & Dolan, 1993). The BSQ-16 has demonstrated strong internal reliability ($\alpha = .93$; Dowson & Henderson, 2001), test-retest reliability ($\alpha = .88$), and concurrent validity ($\alpha = .96$) with other measures of body image disturbance (Rosen, Jones, Ramirez, & Waxman, 1996).

5.2.5. Eating disorder symptomatology (pre- and posttest)

The Eating Attitudes Test-26 (EAT-26; Garner & Garfinkel, 1979; Garner, Olmstead, Bohr, & Garfinkel, 1982) is a 26-item self-report measure of eating disorder pathology, in particular, assessing the symptoms of anorexia nervosa (i.e., symptoms associated with extreme weight loss and restriction). Participants rate the frequency that they have engaged in particular behaviors over the past month on a 6-point Likert-type scale from *always* to *never*. Sample items include the following: "I am terrified of being overweight" and "I feel extremely guilty after eating." Specifically, we examined the total score and two specific subscales: dieting (avoidance of certain foods; EAT-DIET) and bulimia (binge eating and purging behaviors; EAT-BN). The EAT-26 has been found to have strong psychometric properties (Garner et al., 1982).

5.2.6. Health behavior and knowledge (pre- and posttest)

The Health Behavior Questionnaire (HBQ) is a 20-item questionnaire developed by the authors to assess behavioral changes regarding overall health, nutrition, and physical activity. The HBQ is scored on a 6-point Likert-type scale ranging from *never* to *always*. Sample items include "I make efforts to add more footsteps to my daily routine" and "I make an effort to add fruit to my diet every day." The Information Survey (IS) is a 20-item questionnaire developed by the authors to assess changes in health and nutrition knowledge. The IS is scored objectively as correct or incorrect. A sample item includes "True or False: Picking a variety of colors when choosing fruits and vegetables is a good way to add more vitamins and minerals to your diet." In the current sample, Cronbach's alphas at pretest were .773 for the HBQ and .585 for the IS. Although the alpha score for the IS was lower than desired for most self-report measures, given that the items are varied, we did not expect the alpha to be particularly high.

5.2.7. General health, nutrition, and exercise (personal assessment pre and posttest)

As part of a personal assessment (PA) questionnaire developed by the authors, questions about weight concern

were reported on a yes-or-no response scale. These questions included the following: “Are you concerned about weight gain while in recovery?” “Are you concerned that gaining weight could be a trigger for relapse?” and “Are you concerned about using drugs to lose weight after you leave the program?” Participants were also asked to report their ideal weight.

5.3. Procedures

The HSF program was conducted by trained staff with relevant health or substance abuse counseling qualifications. During the first session (pretest), staff described the purpose of HSF emphasizing the voluntary and confidential nature of the project (including that no information would be given to counselors or staff at the primary substance abuse treatment facility). Individuals who did not volunteer to participate in the research aspect of the study were still permitted to participate in the HSF program. If willing to participate in both the HSF program and the research study (which was generally the case), participants signed consent and completed all pretest self-report measures (i.e., demographics, HBQ, IS, BSQ-16, EAT-26, SATAQ-3, and PA). After completing these measures, researchers took physical body assessments (i.e., BMI, BF). Completion of all measures took between 60 and 120 minutes. If a participant was pregnant, she was excluded from the body assessment portion of the research project ($n = 6$).

Following the pretest assessment, the primary 12 HSF program lessons were conducted weekly at each respective treatment facility. Each group session engaged participants in discussions related to the specific lesson. Participants were given take-home assignments, “individual focus/commitment plans” related to the weekly topic, which were then reviewed and discussed the subsequent week. Following the completion of the 12-week HSF curriculum, posttest evaluation tools were administered (i.e., HBQ, IS, BSQ-16, EAT-26; SATAQ-3, and PA), and researchers conducted the posttest physical body assessment (i.e., BMI and BF).

6. Results

The data were analyzed using Statistical Analysis System Version 9.2 for Windows. Paired t tests were performed to detect the differences between pre- and posttest total scores on physical body assessments, SATAQ-3, BSQ-16, EAT-26 (two subscales), HBQ, IS, and PA. McNemar tests were applied for testing differences between paired proportions. Level of significance was set at $p < .05$ for paired t tests and McNemar tests. When comparing participants who completed the HSF program ($n = 124$) with those who dropped out ($n = 133$), there were no significant differences in any of the reported outcome measures at pretest.

6.1. Descriptive information

At baseline, participants ranged in age from 18 to 64 years, with a mean age of 33.37 years ($SD = 10.01$). BMI ranged from 17.5 to 47.0, with a mean of 28.53 ($SD = 6.22$), which is in the overweight range (National Heart, Lung, and Blood Institute, 1998). Similarly, BF percentage ranged from 17.51 to 47.56, with a mean of 31.24 ($SD = 7.30$), which is concern for unsatisfactory health (Thompson, Gordon, & Pescatello, 2010). About 77% of participants indicated they had children ($M = 2.09$, $SD = 1.88$), and most of the participants self-identified racially as White/Caucasian ($n = 75$, 64%), followed by Black/African American ($n = 25$, 20%), Hispanic ($n = 10$, 8%), Asian or Pacific Islander ($n = 5$, 4%), and biracial ($n = 3$, 2%; two participants declined to provide their identification). With regard to educational background, more than a quarter did not complete high school ($n = 33$, 27%), followed by those who graduated from high school ($n = 31$, 25%), and those who completed some college ($n = 26$, 23%). In addition, 11% ($n = 14$) completed college, 9% ($n = 11$) attended a trade or vocational school, and four participants did not indicate their highest level of educational attainment.

When asked to identify a single drug of choice, 39% of participants identified amphetamines ($n = 47$), followed by alcohol ($n = 20$, 17%), polysubstance abuse ($n = 20$, 17%), cocaine/crack ($n = 16$, 13%), opioids ($n = 9$, 7%), marijuana ($n = 5$, 4%), prescription pills (e.g., pain pills; $n = 3$, 2%), and hallucinogens ($n = 1$, 1%). Three individuals did not report a primary drug of choice. Time in substance abuse recovery ranged from 0.25 (1 week) to 236 months (19.67 years), with a mean of 10.02 months ($SD = 33.26$).

6.2. Effectiveness of HSF on thin-ideal internalization, body dissatisfaction, and eating pathology

Table 1 presents results of paired t tests measuring differences in outcomes from pre- to post-HSF participation. As predicted, participants reported significantly less thin-ideal internalization (SATAQ-3 THIN-INT), body dissatisfaction

Table 1
Paired t -test results and means (standard deviation) pre and post HSF intervention

Variable	n	Pre	Post	p
SATAQ-3 THIN-INT	116	25.85 (6.09)	24.49 (5.90)	.013
BSQ-16	112	54.47 (23.11)	45.80 (19.99)	<.0001
EAT-TOTAL	96	9.04 (8.61)	7.62 (8.03)	.048
EAT-DIET	108	6.42 (6.26)	5.32 (5.64)	.019
EAT-BN	112	1.41 (2.72)	0.76 (2.20)	.004
HBQ	98	68.44 (12.05)	75.83 (14.38)	<.0001
IS	121	11.03 (2.61)	13.98 (2.91)	<.0001
Body weight (lb)	112	168.79 (40.17)	173.75 (40.41)	<.0001
BMI	112	28.59 (6.24)	29.41 (6.24)	<.0001
BF (%)	112	31.23 (7.32)	32.05 (6.69)	<.0001

Note. SATAQ-3 THININT = thin-ideal internalization; BSQ-16 = body dissatisfaction; EAT-TOTAL = eating pathology; HBQ = healthy behaviors; IS = nutrition knowledge.

(BSQ-16), and overall eating pathology (EAT-TOTAL) after program participation than before. Specifically, examination of the EAT subscales indicated that participants endorsed significantly less disordered dieting (e.g., severely restrictive eating) and bulimic symptomatology (e.g., binge eating, purging) after program participation than before. In addition, positive health behaviors (HBQ) and health and nutrition knowledge (IS) improved from pre- to post-HSF participation.

6.3. Effectiveness of HSF on anthropomorphic body characteristics

Results from physiological data indicated a significant increase in body weight (lb) from when the individual stopped using drugs (self-reported at 144.12 lb; $SD = 36.55$) to when the intervention began (assessed at 168.79 lb [40.17]) to post intervention (assessed at 173.75 lb [40.41]). Similar results were observed in BMI: Participants had a mean BMI of 24.54, $SD = 5.86$, when drug use stopped (self-reported); 28.59 (6.24) at preintervention; and 29.41 (6.24) at postintervention. BF (%) results also indicated significantly higher values after HSF intervention compared with before.

6.4. Effectiveness of HSF on weight concerns during treatment and recovery

Perceptions of ideal weight and preoccupation with weight gain before and after program participation are presented in Table 2. As predicted, perceived ideal weight increased significantly from pre- to postintervention. Although the proportion of participants expressing concern about weight gain while in recovery did not significantly differ following the intervention, concern that gaining weight may trigger drug-use relapse significantly decreased and concern about using drugs to lose weight after leaving the program also significantly diminished over the course of treatment.

7. Discussion

Data from this study strongly support the efficacy of the HSF program and yield important information for future research and treatment. First and foremost, it is important to note that over 70% of the women in this study reported weight-related concerns while in substance abuse treatment

both before and after HSF program participation. Although this percentage likely overestimates the general prevalence of women with weight-related concerns in substance abuse treatment because some recruitment efforts advertised that the intention of the HSF program is to assist women with weight- and health-related concerns, it reiterates the importance of addressing co-occurring weight-related concerns for women in substance abuse treatment.

Second, key weight-related treatment targets, including thin-ideal internalization, body dissatisfaction, and eating disorder symptoms, were reduced following HSF program participation. Furthermore, participants reported significantly less concern that weight gain would be a trigger for substance abuse relapse. Specifically, nearly half of participants were concerned that gaining weight could be a trigger for relapse, which dropped to 34% post program participation. Likewise, when asked about using drugs to lose weight once they left the program, about 33% expressed concern prior to receiving programming compared with only 18% upon program completion. Together, these results suggest that participants have adopted more healthful attitudes toward their appearance, weight, and extreme weight control behaviors after program participation.

Third, improvements in health behaviors (e.g., increased healthy food consumption and physical activity) and knowledge (e.g., understanding of basic nutrition, exercise, and other health concepts) improved after HSF program participation. As trends in obesity become more prevalent (even within this sample) and drug use negatively affects health outcomes in this population, behavior change and education become vital to helping women in recovery make healthy nutrition and physical activity choices. For example, the diet of a drug user is generally unhealthy, with many (including those in our sample) preferring foods high in sugar and fat (e.g., soda, potato chips, candy) to whole grains, fruits, vegetables, and lean meats (Liber, 2000; Mohs, Watson, and Leonard-Green, 1990). Improved healthy behaviors and knowledge gained from HSF can assist participants in their recovery, as well as provide numerous tools to help achieve a more healthful lifestyle.

Finally, maintaining body weight during recovery is also critical to the success of the individual. HSF is not intended to be a weight loss program; however, it is aimed at educating women about healthy lifestyle practices and helping them set more realistic weight goals. Although the results of the physical body assessment showed a statistically

Table 2
Paired *t* test and McNemar test for PA questions pre and post HSF

Variable	<i>n</i>	Pre	Post	<i>p</i>
“What is your ideal weight?” (lbs) ^a	117	137.01 (23.92)	143.09 (22.84)	<.0001
“Are you concerned about weight gain while in recovery?” ^b	119	75.63 (% yes)	72.27 (% yes)	.394
“Are you concerned that gaining weight could be a trigger for relapse?” ^b	119	45.38 (% yes)	34.45 (% yes)	.007
“Are you concerned about using drugs to lose weight after you leave the program?” ^b	119	32.77 (% yes)	17.65 (% yes)	.001

^a Paired *t* test.

^b McNemar test.

significant increase in BF, weight, and BMI from pre- to postintervention, the increase during treatment was significantly less when compared with weight gain from the time the individual stopped using until they began the HSF program. Although women gained a nominal amount of weight while in the HSF program, results suggest that the weight gain trajectory was slowed significantly. Furthermore, women who participated in HSF were able to identify a significantly higher, more realistic, ideal-weight goal for themselves. This demonstrates that participants gained important awareness of healthy weight ranges and realistic weight goal setting for optimal health.

Although these data supplement existing literature, they are not without limitations. First, the attrition rate was high: Of those who began the program, only 47% finished. However, it is important to note that (a) participants who dropped out did not differ significantly on any outcome measures from those who completed the program and (b) the attrition rate is largely because of participants leaving the treatment center (rather than individuals selecting to leave the HSF program). Consequently, we believe this finding may be more indicative of the fact that individuals seeking substance abuse treatment tend to drop out prematurely (Ball et al., 2006) rather than dissatisfaction with HSF, per se. In addition, this study did not evaluate whether decreases in study outcome measures (i.e., thin-ideal internalization, body dissatisfaction, eating disorder symptoms, and weight-related concerns) changed overall drug use. Furthermore, this sample was not randomly selected; was diverse with regard to some treatment-related variables (e.g., time in treatment, treatment facility); and there was no control group because all participants were in ongoing drug treatment (and expected to be clean and sober). Although using a sample of women in treatment was desirable for the ecological validity of the study, future research should examine whether HSF program participation results in better drug treatment outcomes; replicate these findings using a randomized control study; and examine whether characteristics of the sample (e.g., time in treatment) influence outcomes.

Despite these limitations, the HSF program has several key benefits that have important implications for clinical practice and research. Most importantly, results of this study suggest that the HSF program effectively targets an underserved population: Women in substance abuse treatment with weight and body image issues. Given that weight- and health-related issues are known to influence drug use, particularly for stimulant users (National Center on Addiction and Substance Abuse at Columbia University CASA, 2003; Schinke, Fang, & Cole, 2008), they are not traditionally included in recovery programming. We hope that health and body image programs, such as HSF, can be incorporated into conventional substance abuse treatment. Specific program information can be found at the University of Nevada Cooperative Extension (Lindsay & Velasquez, 2009).

In addition, it is important to note that participants in this sample reported considerable body dissatisfaction, thin-ideal

internalization, and eating pathology before participating in HSF. Although we know of no normative data in substance abusing samples using these measures, mean scores on the BSQ-16 in this sample ($M = 54.26$, $SD = 23.11$) were slightly higher than a college sample of 505 White/European American ($M = 49.55$, $SD = 18.98$) and 151 Hispanic ($M = 46.89$, $SD = 18.25$) women (Warren et al., 2008). Similarly, although mean values of thin-ideal internalization in our sample (THIN-INT $M = 25.81$, $SD = 6.08$) were lower than research conducted in adult patients with eating disorders (e.g., $M = 34.67$, $SD = 9.15$; Calogero et al., 2004), they are relatively similar to female college samples (e.g., $M = 28.67$, $SD = 9.83$; Thompson et al., 2004). With regard to more severe eating pathology, total scores of 20 or more on the EAT-26 are indicative of being at risk for an eating disorder (Garner et al., 1982). Although our mean score at pretest was much lower than 20 (i.e., $M = 9.92$, $SD = 8.36$) and comparable to college samples (e.g., $M = 9.9$, $SD = 9.20$; Garner et al., 1982), 17 of our participants (14%) had scores higher than 20. Clinically, this is consistent with previous research indicating that many women in substance abuse treatment endorse body dissatisfaction, thin-ideal internalization, and eating pathology.

Furthermore, a large percentage of this sample endorsed weight-related concerns related to their drug use. This suggests that it is important for clinicians to assess weight-related concerns in women entering substance abuse treatment to identify the severity of these concerns and address how these issues influence drug use in treatment. One of the more noteworthy findings in this study was that participants believed that weight gain would trigger substance abuse relapse less frequently following HSF participation than before. Consequently, including weight-related treatment targets (e.g., thin-ideal internalization, body dissatisfaction, eating pathology) and addressing weight gain as a trigger for relapse will likely benefit treatment and reduce relapse. Finally, although not specifically tested in this study, future research should examine whether these outcomes differ by drug of choice (e.g., alcohol vs. amphetamines).

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