

## Current Research

# Size Acceptance and Intuitive Eating Improve Health for Obese, Female Chronic Dieters

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**ABSTRACT**

**Objective** Examine a model that encourages health at every size as opposed to weight loss. The health at every size concept supports homeostatic regulation and eating intuitively (ie, in response to internal cues of hunger, satiety, and appetite).

**Design** Six-month, randomized clinical trial; 2-year follow-up.

**Subjects** White, obese, female chronic dieters, aged 30 to 45 years (N=78).

**Setting** Free-living, general community.

**Interventions** Six months of weekly group intervention (health at every size program or diet program), followed by 6 months of monthly aftercare group support.

**Main outcome measures** Anthropometry (weight, body mass index), metabolic fitness (blood pressure, blood lipids), energy expenditure, eating behavior (restraint, eating disorder pathology), and psychology (self-esteem, depression, body image). Attrition, attendance, and participant evaluations of treatment helpfulness were also monitored.

**Statistical analysis performed** Analysis of variance.

**Results** Cognitive restraint decreased in the health at every size group and increased in the diet group, indicating that both groups implemented their programs. Attrition (6 months) was high in the diet group (41%), compared with 8% in the health at every size group. Fifty percent of both groups returned for 2-year evaluation. Health at every size group members maintained weight, improved in all out-

come variables, and sustained improvements. Diet group participants lost weight and showed initial improvement in many variables at 1 year; weight was regained and little improvement was sustained.

**Conclusions** The health at every size approach enabled participants to maintain long-term behavior change; the diet approach did not. Encouraging size acceptance, reduction in dieting behavior, and heightened awareness and response to body signals resulted in improved health risk indicators for obese women.

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**C**oncern regarding obesity continues to mount among government officials, health professionals, and the general public. Obesity is associated with physical health problems, and this fact is cited as the primary reason for the public health recommendations encouraging weight loss (1). That dieting and weight loss are critical to improving one's health is reinforced by a social context that exerts enormous pressure on women to conform to a thin ideal. Public attention to weight and its associated comorbidities continues to increase, and dieting is now firmly ensconced in our cultural identity. The majority of US women are now dieting: 57% stated in a national telephone survey that they are currently engaging in weight-control behaviors (2).

Despite heightened attentiveness to obesity and the increase in dieting behavior (3), the incidence of obesity continues to rise (4). There are little data showing improved long-term success for the majority of those engaged in weight-loss behaviors (5). Some have challenged the ability of diet programs to either achieve lasting weight loss or to improve health, and question the ethics and value of encouraging dieting as an obesity intervention (5-9). Others challenge the primacy of weight loss in addressing the associated health risks, regardless of method (10-12). They suggest that while the epidemiologic research clearly indicates an association between obesity and health risk, the risks of obesity may be overstated, and the association largely results from a sedentary lifestyle, poor nutrition, weight cycling, and/or other lifestyle habits, as opposed to solely reflecting adiposity itself.

Critics of the diet to improve health model suggest a paradigm shift in treating weight-related concerns. They recommend focusing on health behavior change as opposed to a primary focus on weight loss (6,13,14). Their approach is supported by increasing evidence that diseases associated with obesity can be reversed or minimized through lifestyle change, even in the absence of weight change, and that people can improve their health while remaining obese (5,10,12,15).

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- Accepting and respecting the diversity of body shapes and sizes.
- Recognizing that health and well-being are multidimensional and that they include physical, social, spiritual, occupational, emotional, and intellectual aspects.
- Promoting eating in a manner which balances individual nutritional needs, hunger, satiety, appetite, and pleasure.
- Promoting individually appropriate, enjoyable, life-enhancing physical activity, rather than exercise that is focused on a goal of weight loss.
- Promoting all aspects of health and well-being for people of all sizes.

**Figure 1.** Basic guiding principles of the health at every size program. As drafted by the Association for Size Diversity and Health (30).

An alternative obesity treatment model teaches people to support homeostatic regulation and eating intuitively (ie, in response to internal cues of hunger, satiety, and appetite) instead of cognitively controlling food intake through dieting (16). An essential component of some intuitive eating programs is to encourage health at every size (Figure 1) rather than weight loss as a necessary precondition to improved health.

This study was undertaken to examine the effectiveness of a health at every size approach in improving health. [In a previous report (17), we referred to this as a nondiet intervention. This has since been changed to "health at every size" to reflect the changing terminology in the field.] Metabolic fitness (blood pressure and blood lipid levels), energy expenditure, eating behavior (restraint and eating disorder pathology), and psychology (self-esteem, depression, and body image) were evaluated.

## METHODS

### Procedure

Applicants were recruited from the Davis, CA area, and those meeting the following inclusion criteria were enrolled: white; female; aged 30 to 45 years; body mass index (BMI)  $\geq 30$ ; nonsmoker; not pregnant or lactating; Restraint Scale (18) score  $>15$  (indicating a history of chronic dieting); and no recent myocardial infarction, active neoplasms, type 1 diabetes, type 2 diabetes, or history of cardiovascular or renal disease. The research protocol was approved by the Institutional Review Board of the University of California, Davis, and informed consent was obtained.

Enrolled participants ( $N=78$ ) were divided into BMI quartiles and high/low sets for dietary restraint (18), degrees of flexible and rigid control of eating (19), age, and self-reported activity level to ensure balance in the treatment groups. Participants in these subgroups were randomly assigned to one of two treatment groups.

### Treatment Conditions

Two treatment conditions were investigated: a diet group and a health at every size group. Both treatment groups included 24 weekly sessions, each 90 minutes in length. Following this, six monthly aftercare sessions were offered, described as optional group support.

### Diet Group

The focus of the diet group was similar to most behavior-based weight-loss programs: eating behaviors and attitudes, nutrition, social support, and exercise. Participants were taught to moderately restrict their energy and fat intake, and to reinforce their diets by maintaining food diaries and monitoring their weight. Exercise at an intensity within the training heart range delineated in the American College of Sports Medicine/Centers for Disease Control and Prevention guidelines was encouraged. Material was presented on topics including how to count fat grams and exchanges, understanding food labels, shopping for food, the benefits of exercise, and behavior strategies for success. The program was taught by an experienced registered dietitian and reinforced using the LEARN Program for Weight Control manual (20).

### Health at Every Size Group

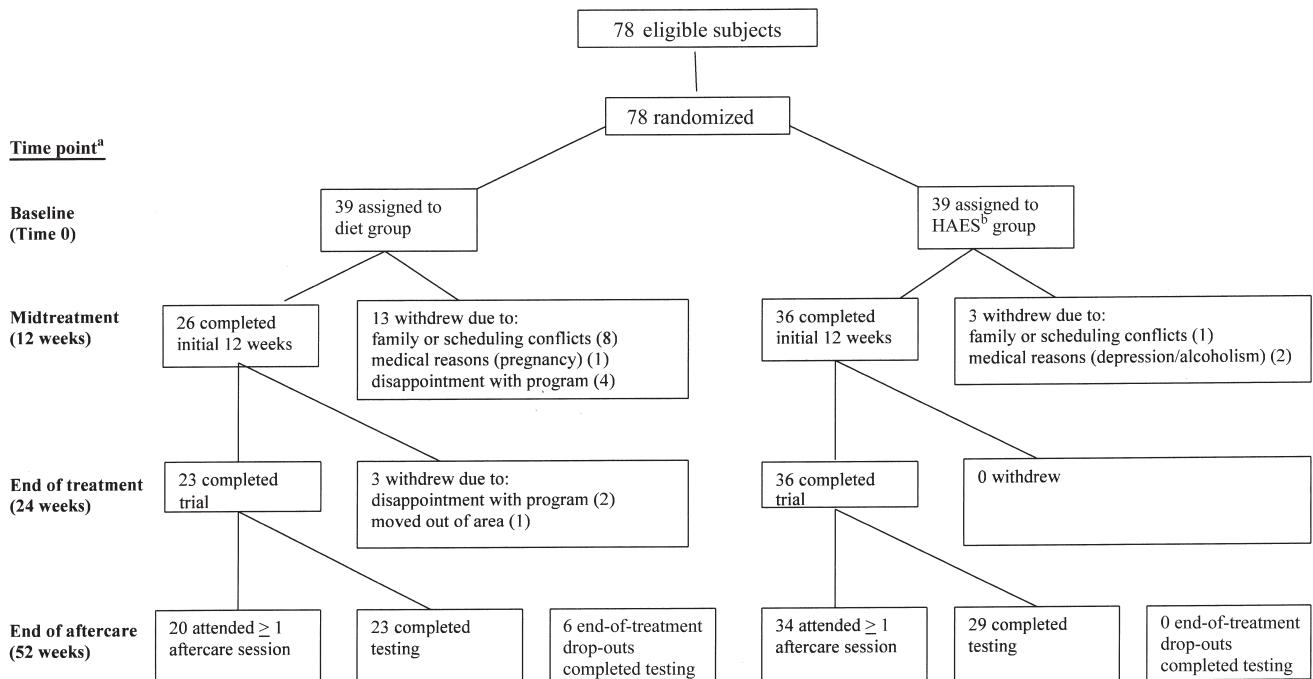
There were five aspects to the health at every size treatment program: body acceptance, eating behavior, nutrition, activity, and social support. The initial focus was on enhancing body acceptance and self-acceptance, and participants were supported in leading as full a life as possible, regardless of BMI. The goal was to first help participants disentangle feelings of self-worth from their weight. The eating behavior component supported participants in letting go of restrictive eating behaviors and replacing them with internally regulated eating. Participants were educated in techniques that allowed them to become more sensitized to internal cues and to decrease their vulnerability to external cues. The nutrition component educated participants about standard nutrition information and the effects of food choices on well-being, and supported them in tempering their food choices with foods that honored good health (in addition to their taste preferences). The activity component helped participants identify and transform barriers to becoming active (eg, attitudes toward their bodies) and to find activity habits that allowed them to enjoy their bodies. The support group element was designed to help participants see their common experiences in a culture that devalues large women, and to gain support and learn strategies for asserting themselves and effecting change. The program was facilitated by a counselor who had conducted educational and psychotherapeutic workshops and groups and had completed all of the coursework necessary to obtain a doctorate in physiology with a focus on nutrition. It was reinforced with a written manual that provided detailed information and practical advice for implementing the strategies (*Bacon L. Hungry Nation: Why the All-American Diet Will Never Satisfy Your Appetite*, unpublished manuscript).

### Evaluation/Outcome Measures

Participants attended five testing sessions: baseline, 12 weeks (midtreatment), 26 weeks (posttreatment), 52 weeks (postaftercare), and 104 weeks (follow-up).

### Anthropometric and Metabolic Fitness Measures

Participants reported to the laboratory in the morning, having abstained from food, beverages, or vigorous activi-



**Figure 2.** Flow chart illustrating diet vs health at every size trial procedures. <sup>a</sup>Measurements taken at each time point. <sup>b</sup>HAES=health at every size.

ity for at least 12 hours. Weight was measured on an electronic scale and height was measured using a wall-mounted stadiometer. Blood pressure was assessed in duplicate using the oscillometric technique. Fasting blood samples were analyzed for blood lipids (total cholesterol, low-density lipoprotein [LDL] cholesterol, and high-density lipoprotein [HDL] cholesterol).

### Energy Expenditure

The Stanford Seven-Day Physical Activity Recall (21) was administered by interview to evaluate time spent in physical activity. A summary of energy expenditure was derived by multiplying the average time of each activity by the average intensity in metabolic equivalents. To minimize interexaminer error and reduce variability, all interviews were conducted by two examiners, who collaborated to achieve consistent scoring.

### Eating Behavior Measures

The Eating Inventory (22) consists of three subscales: cognitive restraint, disinhibition, and hunger. The Eating Disorder Inventory-2 (23) contains eight subscales: three assess attitudes and behaviors toward weight, body shape, and eating (drive for thinness, bulimia, and body dissatisfaction); five measure more general psychological characteristics that are clinically relevant to eating disorders (ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears).

### Psychological Measures

The Beck Depression Inventory (24) measures alterations in mood and self-concept. The Rosenberg Self-Esteem Mea-

sure (25) focuses on a self-evaluation of approval or disapproval. The Body Image Avoidance Questionnaire assesses behaviors associated with negative body image (26).

### Statistical Methods

Power analyses conducted on the Rosenberg Self-Esteem Measure and Beck Depression Inventory from two health at every size studies (27,28) determined that 20 participants per treatment group ( $n=40$  total) were needed to detect a difference of 0.75 standard deviations between groups with 80% power. We attempted to recruit 80 participants to allow for 50% attrition.

All analyses were conducted using Statistica (version 5.1, 1996, Statsoft, Inc, Tulsa, OK). Student's *t* test was used to compare baseline characteristics between groups. Repeated measures analysis of variance with a within-subject factor of time (four levels: baseline, 26 weeks, 52 weeks, and 104 weeks) and a between-subject factor of group (two levels: diet and health at every size) was run to test differences in variables. Significance was set at  $P=.05$ . A least significant difference post-hoc test was run on any variable that indicated significant difference.

### RESULTS

Unless otherwise specified, the reported results include all participants for whom data were available at follow-up: 19 participants from the health at every size group and 19 participants from the diet group, or 50% of each original sample. The 19 participants who returned for follow-up testing in the health at every size group all completed the 26-week program, whereas the 19 participants who returned for testing in the diet group included

**Table 1.** Characteristics of white, female chronic dieters participating in the health at every size program vs diet program weight-loss trial

Characteristic	Health at every size group (n=19)	Diet group (n=19)
Age (y)	← mean±standard deviation →	
Weight (kg)	41.4±3.0	40.0±4.4
BMI <sup>a</sup>	101.1±13.3	101.2±13.8
	35.9±4.6	36.7±4.2
Education	↔ % ↔	
High school or less	5	16
Some college	42	21
College graduate	53	63
Employment status		
Not employed	0	5
Employed	100	95
Job category <sup>b</sup>		
Professional	32	63
Clerical	26	21
Technical	11	11
Physical	0	0
Other	26	5
Relationship status		
Married or domestic partnership	89.5	68
Single	10.5	32

<sup>a</sup>BMI=body mass index; calculated as kg/m<sup>2</sup>.

<sup>b</sup>Refers to those currently employed.

16 program completers, and three participants who had dropped out of the program (see Figure 2). The statistical significance is not different when the dropouts are excluded from the analysis (although average values and standard deviations are altered). Results of some aspects were occasionally invalid or unavailable, resulting in small variation in the number of participants reported on for each measure.

## Participants

Table 1 shows the sociodemographic characteristics of the reported subject population. There was no significant difference in age, initial weight, or BMI. The sociodemographic profile of the completers and study dropouts was similar.

## Attrition

Program attrition was previously reported (17). Almost half of the diet group dropped out (42%) before the end of treatment, whereas almost all (92%) of the health at every size group completed the program.

## Weight-Related Measures

As shown in Table 2, the health at every size group members maintained weight and BMI throughout the study and follow-up period. The diet group significantly decreased their weight posttreatment ( $-5.2 \text{ kg} \pm 7.3$  from

baseline), such that their weight loss was 5.2% of the initial weight. They maintained the weight loss postaftercare ( $-5.3 \text{ kg} \pm 6.7$  from baseline), but regained some of the weight such that weight was not significantly different between baseline and follow-up ( $P=.068$ ). There was a parallel pattern to the change in BMI.

## Blood Lipid Levels and Blood Pressure Measures

As indicated in Table 3, the health at every size group members showed an initial increase in total cholesterol, followed by a significant decrease from baseline at follow-up. The diet group members showed no significant change in total cholesterol at any time. Both groups showed a significant decrease in LDL cholesterol levels postaftercare: the health at every size group sustained this improvement at follow-up and LDL cholesterol levels in the diet group were not significantly different between baseline and follow-up. HDL cholesterol levels decreased in both groups.

Both groups showed a significant lowering of systolic blood pressure posttreatment and postaftercare. The health at every size group sustained this improvement at follow-up ( $P=.043$ ), whereas the diet group did not quite achieve significance in sustaining their improvement ( $P=.051$ ). There was no significant change in diastolic blood pressure in either group at any time.

## Activity Measures

The health at every size group demonstrated a significant increase in daily energy expenditure posttreatment and at follow-up. This was not significant at 52 weeks. There was also an almost fourfold increase in moderate activity at follow-up, which was the only of the individual activity factors that was significantly different from baseline. The sum of time spent in moderate, hard, and very hard activity was also significantly increased for the health at every size group at follow-up, such that it was slightly more than double initial values. The diet group showed a significant increase in some aspects of energy expenditure postaftercare; however, none of these were sustained at follow-up.

## Eating Behavior Measures

Both groups started with relatively low cognitive restraint (restricted eating). This changed in opposite directions in the two groups: it significantly decreased in the health at every size group and significantly increased in the diet group posttreatment and post-aftercare (Table 4). The health at every size group sustained this change at follow-up; the restraint scores of the diet group were not significantly different between baseline and follow-up. Post-hoc analysis demonstrated a significant between-group difference between baseline and follow-up. Both groups also demonstrated significant improvement posttreatment on the two other Eating Inventory subscales; that is, hunger (susceptibility to hunger) and disinhibition (loss of control that follows violation of self-imposed rules). The health at every size group maintained these improvements; the diet group maintained the improvement in disinhibition, but not hunger.

**Table 2.** Weight-related measures of white, female, chronic dieters by treatment condition over time

Measure	Mean Values±Standard Deviation				Baseline to Follow-up Comparison (P Value)	
	Baseline (Time 0) (Diet <sup>a</sup> n=19; HAES <sup>b</sup> n=19)	Posttreatment (24 weeks) (Diet n=16; HAES n=19)	Postaftercare (52 weeks) (Diet n=18; HAES n=18)	Follow-Up (104 weeks) (Diet n=19; HAES n=19)	Within-group analysis	Between-group analysis
<b>Weight (kg)</b>						
Diet	101.2±13.8	96.8±14.2 <sup>d</sup>	95.4±11.9 <sup>d</sup>	98.0±14.3	.068	.116
HAES	101.1±13.3	101.8±13.4	101.4±13.6	101.5±16.3	.817	
<b>BMI<sup>c</sup></b>						
Diet	36.7±4.2	35.3±4.1 <sup>d</sup>	34.7±3.5 <sup>d</sup>	35.5±4.6	.068	.786
HAES	35.9±4.6	36.1±4.6	36.0±4.5	36.0±5.4	.868	
<b>Weight change from baseline</b>						
Diet	...	-5.2±7.3	-5.3±6.7	-3.2±7.2	.515	.116
HAES	...	0.6±2.1 <sup>e</sup>	0.6±4.4 <sup>e</sup>	0.3±6.3	.841	

<sup>a</sup>Diet=diet group.<sup>b</sup>HAES=health at every size group.<sup>c</sup>BMI=body mass index; calculated as kg/m<sup>2</sup>.<sup>d</sup>Significant within-group difference from baseline.<sup>e</sup>Significant between-group difference.**Table 3.** Blood lipid and blood pressure measures of white, female, chronic dieters by treatment condition over time

Measure	Mean Values±Standard Deviation				Baseline to Follow-up Comparison (P Value)	
	Baseline (Time 0)	Posttreatment (24 weeks)	Postaftercare (52 weeks)	Follow-up (104 weeks)	Within-group analysis	Between-group analysis
<b>Total cholesterol (mmol/L)<sup>a</sup></b>						
Diet <sup>b</sup> (n=17)	4.50±0.74	4.96±0.94	4.20±0.79	4.24±0.72	.222	.364
HAES <sup>c</sup> (n=17)	4.61±0.80	5.35±0.77 <sup>d</sup>	4.32±0.75	4.07±0.77 <sup>d</sup>	.026 <sup>e</sup>	
<b>High-density lipoprotein cholesterol (mmol/L)</b>						
Diet (n=17)	1.20±0.27	1.23±0.34	1.18±0.32	1.01±0.25 <sup>d</sup>	.009 <sup>e</sup>	.404
HAES (n=18)	1.29±0.29	1.23±0.21	1.14±0.23 <sup>d</sup>	1.03±0.16 <sup>d</sup>	.000 <sup>e</sup>	
<b>Low-density lipoprotein cholesterol (mmol/L)</b>						
Diet (n=17)	2.99±0.95	3.01±0.79	2.31±0.48 <sup>d</sup>	2.63±0.57	.236	.572
HAES (n=18)	3.01±0.83	3.22±0.55	2.55±0.64 <sup>d</sup>	2.53±0.51 <sup>d</sup>	.038 <sup>e</sup>	
<b>Systolic blood pressure (mm Hg)</b>						
Diet (n=18)	127.6±11.1	120.1±12.2 <sup>d</sup>	116.6±10.9 <sup>d</sup>	121.3±16.9	.051	.982
HAES (n=16)	125.8±14.2	119.9±12.9 <sup>d</sup>	119.9±15.4 <sup>d</sup>	119.5±11.7 <sup>d</sup>	.043 <sup>e</sup>	
<b>Diastolic blood pressure (mm Hg)</b>						
Diet (n=18)	73.2±8.0	71.6±9.7	69.5±8.1	73.3±10.6	.938	.403
HAES (n=16)	70.3±9.0	67.8±7.1	69.7±8.4	68.3±8.0	.307	

<sup>a</sup>To convert mmol/L cholesterol to mg/dL, multiply mmol/L by 38.7. To convert mg/dL cholesterol to mmol/L, multiply mg/dL by 0.026. Cholesterol of 5.00 mmol/L=193 mg/dL.<sup>b</sup>Diet=diet group.<sup>c</sup>HAES=health at every size group.<sup>d</sup>Significant within-group difference from baseline.<sup>e</sup>Significant between-group difference.

**Table 4.** Eating behavior/psychological measures of white, female, chronic dieters by treatment condition over time

Measure	Mean Values±Standard Deviation				Baseline to Follow-up Comparison (P Value)	
	Baseline (Time 0) (Diet <sup>a</sup> n=19; HAES <sup>b</sup> n=19)	Posttreatment (6 months) (Diet n=16; HAES n=19)	Postaftercare (12 months) (Diet n=18; HAES n=18)	Follow-up (24 months) (Diet n=19; HAES n=19)	Within-group analysis	Between-group analysis
<b>Eating inventory</b>						
<b>Restraint</b>						
Diet	7.9±4.9	11.9±4.0 <sup>c</sup>	10.9±3.9 <sup>c</sup>	9.6±4.7	.076	.007 <sup>d</sup>
HAES	7.6±4.0	5.6±3.7 <sup>ce</sup>	5.2±3.1 <sup>ce</sup>	5.4±3.3 <sup>ce</sup>	.047 <sup>d</sup>	
<b>Hunger</b>						
Diet	8.1±3.5	5.6±4.2 <sup>c</sup>	6.3±3.6	7.1±3.9	.216	.268
HAES	8.4±2.9	4.4±3.1 <sup>c</sup>	5.2±3.3 <sup>c</sup>	6.1±4.0 <sup>c</sup>	.014 <sup>d</sup>	
<b>Disinhibition</b>						
Diet	12.2±2.1	8.4±2.8 <sup>c</sup>	9.7±3.0 <sup>c</sup>	10.3±3.1 <sup>c</sup>	.013 <sup>d</sup>	.070
HAES	12.1±2.5	7.6±4.2 <sup>c</sup>	7.2±4.3 <sup>c</sup>	8.2±3.9 <sup>c</sup>	.000 <sup>d</sup>	
<b>Eating disorders inventory<sup>f</sup></b>						
<b>Drive for thinness</b>						
Diet	4.6±4.6	2.9±2.7	3.2±4.1	3.7±3.2	.354	.042 <sup>d</sup>
HAES	7.1±6.1	2.6±3.3 <sup>c</sup>	2.6±3.9 <sup>c</sup>	2.6±3.6 <sup>c</sup>	.004 <sup>d</sup>	
<b>Bulimia</b>						
Diet	4.6±4.0	1.3±2.1 <sup>c</sup>	1.1±1.4 <sup>c</sup>	2.7±3.7	.061	.464
HAES	3.8±3.4	1.1±1.5 <sup>c</sup>	0.8±1.9 <sup>c</sup>	1.1±1.4 <sup>c</sup>	.002 <sup>d</sup>	
<b>Body dissatisfaction</b>						
Diet	17.5±5.9	15.1±6.2 <sup>c</sup>	17.0±7.7	16.8±8.0	.634	.023 <sup>d</sup>
HAES	17.9±4.5	12.8±7.5 <sup>c</sup>	13.6±8.3	11.9±6.6 <sup>ce</sup>	.002 <sup>d</sup>	
<b>Interoceptive awareness</b>						
Diet	3.5±4.3	2.1±3.2	0.9±1.4 <sup>c</sup>	2.3±3.2	.123	.425
HAES	4.6±4.5	3.3±3.5	2.8±4.6	2.4±3.1 <sup>c</sup>	.038 <sup>d</sup>	
<b>Beck Depression Inventory</b>						
Diet	7.5±7.2	4.5±6.3 <sup>c</sup>	3.9±4.9 <sup>c</sup>	6.6±5.6	.134	.011
HAES	10.3±9.5	6.9±9.3 <sup>c</sup>	6.4±9.4 <sup>c</sup>	6.6±8.8 <sup>c</sup>	.001 <sup>d</sup>	
<b>Rosenberg Self-Esteem Inventory</b>						
Diet	31.2±5.5	32.5±5.5	32.2±4.8	29.1±5.8 <sup>c</sup>	.028 <sup>d</sup>	.000 <sup>d</sup>
HAES	30.9±3.8	32.1±5.8	32.4±5.6	33.7±4.5 <sup>ce</sup>	.001 <sup>d</sup>	
<b>Body image avoidance</b>						
Diet	38.3±8.1	36.2±6.3	35.9±6.1	34.2±6.5	.059	.187
HAES	38.9±11.2	29.6±9.1 <sup>ce</sup>	28.4±9.9 <sup>ce</sup>	30.3±10.0 <sup>c</sup>	.003 <sup>d</sup>	

<sup>a</sup>Diet=diet group.<sup>b</sup>HAES=health at every size group.<sup>c</sup>Significant within-group difference from baseline.<sup>d</sup>Significant difference from baseline to follow-up.<sup>e</sup>Significant between-group difference.<sup>f</sup>Four Eating Disorder Index subscales did not change and are not reported (ineffectiveness, interpersonal distrust, maturity fears, perfectionism).

The health at every size group demonstrated significant improvement between baseline and follow-up in four of the eight Eating Disorder Inventory-2 subscales: drive for thinness, bulimia (binge eating behavior), body dis-

satisfaction, and interoceptive awareness (ability to recognize and respond to internal states such as emotions, hunger, and satiety). The diet group showed an initial improvement in three subscales (bulimia, body dissatis-

faction, and interoceptive awareness), although none of these improvements were sustained at follow-up. (A decrease in interoceptive awareness score represents improvement, because elevated scores represent a defect in perception.) Post-hoc analysis demonstrated a significant between-group difference in the drive for thinness and body dissatisfaction subscales between baseline and follow-up.

### Psychological Measures

Both groups demonstrated significant improvement in depression posttreatment and postaftercare; the health at every size group sustained this improvement at follow-up, whereas the diet group did not (Table 4). The health at every size group demonstrated a significant improvement in self-esteem at follow-up; the diet group demonstrated a significant worsening. Post-hoc analysis indicated significant between-group difference. The health at every size group also demonstrated significant improvement in body image avoidance behavior ( $P=.003$ ), whereas improvement in the diet group was not statistically significant.

### Participant Evaluations

There was a significant between-group difference in all four participant evaluation questions ( $P=.000$ ). In response to the statement, "My involvement with the Healthy Living Project (name of study) has helped me to feel better about myself," 100% of the health at every size participants endorsed "Agree" or "Strongly Agree" compared with 47% of the diet group participants. Ninety-five percent of the health at every size group participants endorsed "Disagree" or "Strongly Disagree" regarding the statement, "I feel like I have failed in the program," whereas 53% of the diet group endorsed "Agree" or "Strongly Agree." One hundred percent of health at every size participants were "hopeful that the Healthy Living Project would have a positive life-long impact" on them, compared with 37% of the diet group. Eighty-nine percent of the health at every size group endorsed "Regularly" or "Often" in response to the statement: "I currently implement some of the tools that I learned in the Healthy Living Project," compared with 11% of the diet group.

### DISCUSSION

There are two aspects of the health at every size model that differ from the traditional treatment approach and concern health care practitioners. First, although dieters are encouraged to *increase* their cognitive restraint to decrease energy intake, health at every size participants are encouraged to *decrease* their restraint, relying instead on intuitive regulation. Second, the health at every size model supports participants in accepting their size, whereas in the diet model, reduction in size (weight loss) is emphasized. Many health care practitioners fear that health at every size is irresponsible and that these aspects will result in indiscriminate eating and increased obesity (16). Our data at 2 years indicate this concern is unfounded.

Both groups were implementing their encouraged restraint pattern at the conclusion of the intervention and the aftercare program. The diet group did not sustain this im-

proved restraint at follow-up, which is consistent with the literature. The health at every size group members, on the other hand, were able to sustain their decrease in restraint (and interoceptive awareness) at follow-up. In other words, health at every size participants became sensitized to body signals regulating food intake, increased their reliance on these signals as regulators of intake, and were able to maintain this behavior change over the 104-week period.

Improvements in many of the health behaviors and health risk markers paralleled the relative success that each group had in maintaining their restraint habits. For example, both groups showed initial improvements in depression, in all of the other scales related to eating behavior and attitudes toward weight and food, and in many aspects of metabolic functioning and energy expenditure. The health at every size group sustained their restraint habits and all of these improvements at follow-up, whereas members of the diet group returned to baseline in their restraint habits and all but the disinhibition scale.

The health at every size group also demonstrated a parallel improvement in self-esteem, and 100% of participants reported that their involvement in the program helped them feel better about themselves (compared with 47% of the diet group). The diet group, on the other hand, demonstrated initial improvement followed by a significant worsening of self-esteem at follow-up. This damage to self-esteem was reinforced in other of the self-evaluation questions. For example, 53% of participants in the diet group expressed feelings of failure (compared with 0% of health at every size participants).

The diet group's change in weight exhibited the same pattern: There was a decrease in weight at the program conclusion, then a gradual regain, such that the final weight loss of 3.2 kg was not significant ( $P=.068$ ). The health at every size group members, on the other hand, maintained weight throughout the study. The fact that the improvements in health risk indicators occurred during relative weight stability demonstrates that improvements in metabolic functioning can occur through behavior change, independent of a change in weight. Given the well-documented difficulties in sustaining weight loss, this is a particularly important result, and provides further support for redirecting clients toward behavior change as opposed to a primary focus on weight.

One limitation of the study was the small sample size available at follow-up (50% of the original participants). Considering that the diet group had high attrition (42%), and that part of the attrition in diet programs is due to participants' dropping out when they are not successful (29), it is likely that the results for the diet group may look more favorable than was actually the case had all the participants been considered. Because program attrition in the health at every size group was markedly lower (8%), this inflation may be less pronounced in the results of the health at every size group at program end.

It also should be noted that only 2-year follow-up was conducted; longer follow-up (eg, 5 years) is suggested to make more conclusive statements about long-term benefits.

### CONCLUSIONS

Weight loss has been established as standard treatment for obesity. Although often successful in the short term, it has shown limited long-term success in mitigating obe-

sity and its associated health problems for the majority of dieters. Findings in the diet group were consistent with previous literature. There was high attrition (42%), and postaftercare data (1 year after program initiation) for program completers indicated weight loss and improvement in health risk indicators, although neither of these were sustained at follow-up (2 years after program initiation). Diet group participants additionally experienced an overall detrimental effect on self-esteem and other self-evaluation measures.

In contrast to a diet program, the health at every size approach encourages persons to accept their body weight, and to rely on their body signals to support positive health behaviors and help regulate their weight. Results from this randomized clinical trial were remarkably positive, with health at every size group participants showing sustained improvements in many health behaviors and attitudes as well as many health risk indicators associated with obesity (including total cholesterol, LDL cholesterol, systolic blood pressure, depression, and self-esteem, but not HDL cholesterol). The data suggest that a health at every size approach enables participants to maintain long-term (2 years) behavior change, whereas a diet approach does not.

Encouraging size acceptance, a reduction in dieting, and a heightened awareness of and response to body signals appears to be effective in supporting improved health risk indicators for obese, female chronic dieters.

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