The Solution Method: 2-year trends in weight, blood pressure, exercise, depression, and functioning of adults trained in development skills

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ABSTRACT

This study describes changes observed during a 2-year period in participants enrolled in The Solution Method, a developmental skills training program for adult weight management. This intervention is the adult application of a model of treatment previously used only in the management of pediatric obesity (The Shapedown Program). Developmental skills training integrates understandings and methods from developmental, family systems, biomedical, genetic, and behavioral theories of the etiology of obesity. Twenty-two subjects (mean age=43.4±8.5 years and mean body mass index=33.1±5.3) completed a group intervention based on this method, which was conducted by a registered dietitian and a mental health professional. Questionnaire responses indicated the extent to which their weight was a medical and/or psychosocial risk. Subjects attended 2-hour weekly sessions for an average of 18 weeks during which they were trained in six developmental skills: strong nurturing, effective limits, body pride, good health, balanced eating, and mastery living. Data, which were collected at the beginning of treatment and at 3, 6, 12, and 24 months, included weight, blood pressure, 7-day exercise recalls, and responses to depression and functioning (psychosocial, vocational, and economic) questionnaires. Participants' weights decreased throughout the 2-year period of the study: mean weight change was –4.2 kg (3 months), –6.0 kg (6 months), –7.0 kg (12 months), and –7.9 kg (24 months). In addition, compared with baseline values, systolic and diastolic blood pressure, exercise, and depression improved throughout the study period. These improvements were statistically significant at 24 months for weight ($P<.01$), systolic blood pressure ($P<.02$), diastolic blood pressure ($P<.001$), and exercise ($P<.001$); the results were not statistically significant for depression. Most participants reported improvement in a broad range of aspects of functioning. We conclude that this application of developmental skills training for adult weight management may produce significant long-term beneficial effects. *J Am Diet Assoc. 1997;97:1133-1138.*

During the 1980s, the prevalence of adult obesity increased 8%, an increase of 37% above obesity rates at the beginning of the decade (1). Although the dietitian is typically identified as the member of the health care team who treats this condition, current obesity treatment modalities have shown disappointing long-term effectiveness. For example, behavioral treatments appear safe but initial weight losses may not be sustained (2-4), and pharmacologic treatments have serious health risks and require continued administration to sustain weight loss (5,6). Although the etiology of obesity has been shown to have a genetic component (7,8), body weight is highly variable over time (1,9), which suggests the importance of potentially modifiable environmental factors. As a result, the identification of new models of obesity treatment that are safe and produce beneficial results that are sustained after treatment is important to dietitians.

In this article we describe a model of adult obesity treatment that is different from previous methods. It trains participants intensively in six intrapsychic developmental skills thought to regulate adaptive mind, body, and lifestyle patterns. The goal of the treatment is for participants to integrate these skills into their normal psychological functioning, thereby promoting sustained improvements in many aspects of life, including eating and physical activity. Previous methods have differed from this intervention in that they have used treatments external to the participant (eg, taking weight-loss drugs and adhering to a prescribed diet) or have targeted internal changes that are less comprehensive (eg, cognitive therapy) than those included in this method. We present preliminary data on changes observed in program participants during a 2-year period.

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Table 1
Six developmental skills for adult weight management[a]

Skill	To enhance this skill	Ask this question[b]
Mind skills		
Strong nurturing	Identify feelings	How do I feel?
	Recognize needs	What do I need?
	Request support	Do I need support?
Effective limits	Have reasonable expectations	Are my expectations reasonable?
	Develop positive, powerful cognitions	Is my thinking positive and powerful?
	Accept difficulties	What is the essential pain?
Body skills		
Body pride	Stop weightist cognitions	Am I avoiding weightist thoughts?[c]
	Identify unconscious drives to remain overweight	Am I using words, not my weight, to express myself?[d]
	Honor and accept body	Am I honoring and accepting my body?
Good health	Be aware of health	Am I aware of my health?
	Use self-care effectively	Am I taking care of my body?
	Use health care effectively	Is my health care effective?
Lifestyle skills		
Balanced eating	Eat regularly	Am I eating regular meals?
	Eat in response to hunger and satiety	Do I eat in response to hunger?
	Participate in unrestrained, healthful eating	Is my food both healthful and pleasurable?
Mastery living	Engage in physical activity daily	Am I physically active?
	Receive fulfillment	Am I engaging in activities that are meaningful?
	Restore oneself	Am I taking time to restore myself?[e]

[a]Each skill involves asking three questions, the answers to which result in cognitive, emotive, and/or behavioral change. In group sessions participants practice the six skills through individual verbal and written work and role plays. Groups are conducted for 2 hours weekly by a registered dietitian and a licensed mental health professional who have completed a 30-hour continuing education course on program delivery.
[b]Ask these internal, regulating questions often enough throughout the day to "feel balanced in mind, body, and lifestyle."
[c]Avoid cognitions of body disparagement (eg, "My body is disgusting."). Weightism is discrimination on the basis of body weight.
[d]Express verbally the need that maintaining a large body size would otherwise fulfill (eg, saying, "I need more power" or "Don't expect much of me"), so that the need to maintain a larger body size to express these needs diminishes.
[e]Allow time daily for activities that are restoring physically, emotionally, intellectually, and spiritually.

BACKGROUND

Despite poor long-term outcomes produced by behavioral treatments for obesity in adults, research on family-based treatments of child obesity suggests that such treatments may be both safe and effective in producing sustained posttreatment weight loss (10-13). One study reported weight loss sustained 10 years after treatment (13). Although the causes of this discrepancy in effectiveness between pediatric and adult behavioral obesity treatments are unclear, they appear related to family variables (14). One possibility is that these interventions alter family interaction, which influences individual lifestyles. Of interest is a growing body of literature suggesting that obesity-related behaviors may be associated with psychosocial distress (15-19) and family dysfunction (20-23), both of which are thought to be influenced by certain developmental skills. Weight maintenance has been shown to improve when family therapy is added to diet and exercise interventions (14). In fact, psychosocial distress, developmental skills (24-26), and family functioning (27,28) are interdependent. Without sufficient levels of developmental skills, family functioning and psychological well-being are likely to be compromised.

In 1979, the Shapedown Program (11,29) was developed at a university setting with support from the federal Bureau of Maternal and Child Health and the American Cancer Society. In 1987, the current developmental skills model of obesity treatment was developed by L. Mellin, and the Shapedown Program, which was originally a behavioral intervention, was rewritten to reflect this model. The program was then disseminated to other clinical sites. In 1991, developmental testing of the application of this model to adults was undertaken and the results of the subsequent sessions are reported herein. The intervention was renamed The Solution Method (30) for two reasons. First, based on a survey (conducted by L. Mellin), obese men—an underserved population in obesity interventions—rated this name the highest among the options presented to them. Second, this name suggests an intervention that goes beyond treating a symptom to addressing more fundamental aspects of human functioning. The name suggests that weight loss alone is not a remedy for the constellation of correlates of obesity. The Solution Method was designed to be delivered by a team consisting of a registered dietitian and a licensed mental health professional who have completed 30 hours of self-study training and certification in this treatment method (31). Program dissemination began in 1997.

PROCEDURES AND SUBJECTS

Of 2 men and 27 women between the ages of 23 and 58 years who enrolled in The Solution Method offered at an urban university setting, 22 participants completed at least 12 weeks of the intervention (4 completed 50% or fewer of the meetings and were considered dropouts) and were available for data collection (3 were unavailable at follow-up). Subjects were recruited through a newspaper article and they paid normal clinical fees for this service (ie, $300 per 12-week session). They had to meet one criterion: based on questionnaire (30) responses, the subject's overweight was classified as a medical risk, a psychosocial risk, or both. This criterion was used rather than criteria based on ponderosity and absence of psychological difficulties in order to study subjects who more accurately represented the population dietitians treat for weight prob-

lems. All subjects were treated at the same site by the same group instructors, a registered dietitian and a licensed psychologist. The study design was approved by the University of California, San Francisco Committee on Human Research.

The mean (±standard deviation) body mass index (calculated as kg/m^2) of subjects was 33.1±5.3, mean weight was 93.0±18.8 kg, and mean age was 43.4±8.5 years. Participants were mainly white (20 non-Hispanic white, 1 black, and 1 Hispanic) and female (21 women and 1 man) and most were employed as clerical staff or administrators. Half the patients elected to continue the intervention for a second 12-week session. Mean number of weeks of participation was 18. At the completion of the intervention, group leaders identified participants who had not exhibited in verbal or written practices during group sessions any competency in using the six skills of this method. These persons missed 20% to 50% of sessions and typically seemed hostile or withdrawn during group sessions.

Demographic and height data were collected initially only. Weight was ascertained by determining subjects' weight on a beam-balance scale. A 7-day exercise recall (physical activity in the previous 7 days reported by telephone interview and/or written in response to the question, "How many minutes did you exercise in the last 7 days?") was also obtained at 3, 6, 12, and 24 months. Data were collected by a dietitian and a nurse.

Structured interviews, with open-ended questions about functioning, were conducted by L. Mellin at 12 and 24 months. In addition, a questionnaire about functioning was developed and administered at 24 months. The functioning questionnaire probed a broad range of aspects of life: health, happiness, relationships, work, finances, substance use, and spirituality. Spirituality was included because in the 12-month interview many participants volunteered that they had observed spiritual changes and a growing awareness of a potential relationship between spirituality and obesity (32,33). The questionnaire included 18 multiple-choice questions that evaluated change since the start of treatment (eg, changes in the past 2 years in your finances: saving more, saving less, no change, not a problem). Scoring was designed to produce conservative findings. For example, a participant "improved" in financial savings if her or his response to the question was "more," indicating the existence of both an initial problem and an improvement.

For 13 participants, data on depression and blood pressure were also collected initially and at 3 and 24 months. The Beck Depression Inventory (Short Form) (34), a 13-item multiple-choice measure of depressive attitudes and symptoms ranked to indicate degree of severity, was administered. A score of 0 to 7 indicated mild or no depression, 8 to 15 moderate depression, and 16 to 39 severe depression. Blood pressure data were collected by a physician (L. Dickey) and a nurse according to standard methods (eg, appropriate cuff sizes, patient in seated position).

To determine change in weight, exercise, depression, blood pressure, and functioning for each period of data collection, an epidemiologist (M. Croughan-Minihane) analyzed data by hand calculations. Paired t tests were used to assess the statistical significance of changes between initial values and 24-month values for weight, blood pressure, exercise, and depression. The P values were corrected for running multiple t tests on these data.

THE INTERVENTION

The instructional objective of The Solution Method is that program participants will be able to demonstrate the use of six specific skills (Table 1): Two "mind" skills, strong nurturing and effective limits; two "body" skills, body pride and good health; and two "lifestyle" skills, balanced eating and mastery living.

A review of the literature suggests that these skills enable persons to adopt behavioral patterns that are adaptive. Such skills were identified by L. Mellin as a result of an integration of research on human development, family systems theory, and behavioral and biological aspects of obesity, with particular emphasis on the work of certain researchers (20,25-29).

These psychological skills are thought to develop during childhood in those who are raised with authoritative parenting practices that promote a responsive environment. These skills may be less likely to develop in children raised with permissive or authoritarian parenting, which may result in a neglectful or abusive environment (35). Theoretically, the skills can be mastered at any age, and because they are often self-reinforcing, they tend to stimulate more adaptive behavior and their use is likely to persist. Moreover, they have the potential to promote healthful diet and exercise patterns and other adaptive behaviors that may have a beneficial influence on weight-loss maintenance.

The program objective is for participants to be able to demonstrate the use of six specific developmental skills: strong nurturing, effective limits, body pride, good health, balanced eating, and mastery living

The orientation of the method is not on decreasing the pathologic condition of a person but on more effectively accessing the inherent health in a person. Obesity is not seen as a personal defect but as the predictable result of various differences in genetics (7,8), temperament (36), external stressors, and/or notable environmental barriers to maintaining healthful lifestyles. The symptom of overweight presents the opportunity to acquire higher levels of these developmental skills to adapt to these circumstances.

Training in these specific skills in group sessions involves cognitive, emotive, behavioral, and interactional techniques (34). Instead of providing education or insight, the sessions are devoted to practicing these skills. For example, a participant in a group session states that an eating binge occurred after a telephone conversation with her mother. The response from the provider is not to give insight as it would in a psychotherapy group (eg, "What is the relation between your eating and your mother?") or to manage behavior as it would be in a behavioral group (eg, "What were your choices in addition to overeating?"). Rather, in this method, the provider guides the participant in using the skills (eg, "Will you use the skills to practice bringing yourself back into balance?"). Each weekly session of 2 hours was conducted by a registered dietitian and a licensed mental health professional. In addition to attending these

group sessions, participants were instructed to make at least one telephone call to another group member each week (called community connections), to complete journals (thinking journals and feelings letters) that lessen distress and facilitate use of the six developmental skills, and to record their progress in using these skills.

RESULTS

Observed changes (Table 2) included decreasing weight throughout the study period. A statistically significant difference was noted between mean weight at baseline and at 24 months ($P<.01$). Physical activity increased over baseline levels at each of the data collections periods, and the increase in mean time spent in exercise between baseline and 2 years was statistically significant ($P<.001$).

In the 13 participants for whom blood pressure and depression data were available, improvements were observed. Changes in mean diastolic blood pressure were noted at 3 months and at 24 months. Paired t test results indicated that differences between baseline and 24-month blood pressure readings were significant for both diastolic ($P<.02$) and systolic blood pressure ($P<.001$). Mean baseline depression score at baseline indicated that 7 participants had mild or no depression, 5 moderate, and 1 severe. Mean depression score improved at 3 months and at 24 months. Differences between baseline and 24 month depression scores were not significantly different.

The percentage of participants (Table 3) who improved in several health indexes at 12 and 24 months ranged from 32% to 91%. Improvements in various aspects of psychosocial, vocational, and economic functioning ranged from 41% to 91%.

DISCUSSION

Our data show a trend toward long-term improvement in a broad range of variables, including weight, in adults who were trained to use the six developmental skills of The Solution Method. The theoretical basis of the program—that is, training adults in basic developmental skills to promote sustained weight loss and a broad range of improvements in health and functioning—is consistent with these findings.

The continuation of weight loss long after the cessation of treatment is noteworthy, because treatment with behavioral interventions (2-4,37-39), very-low-energy diets (40-44), and weight-loss drugs (5,6,45) are commonly associated with a pattern of weight regain after treatment ends.

Skender and colleagues (2) reported on weight change between baseline and 2 years for behavioral diet, behavioral exercise, and behavioral combined therapies. Weight changes were not significant for any of the groups; the "diet-only" group actually experienced a weight gain at 2 years of 0.9±7.7 kg. The "exercise only" and "combination of diet and exercise" groups had mean weight losses of –2.7±9.2 kg and –2.2±6.7 kg, respectively. In contrast, weight change at 2 years in our study was more substantial: –7.9±10.1 kg.

Similarly, Wadden and Bartlett (41) followed up 76 women randomly assigned to treatment by very-low-energy diet alone, behavioral therapy, or behavioral therapy combined with a 1,200 kcal/day diet. In all three treatment conditions, weight was regained by 1-year follow-up.

Perri and colleagues (37-39) have shown that the rate of weight regain can be diminished through continuing care. In one study (38), patients who complied with moderate energy restriction and attended weight-loss meetings weekly for the initial 20 weeks of treatment and 52 weeks of the maintenance sessions maintained 97% of their initial weight loss; in contrast, without maintenance sessions, weight regain was nearly 50%

Table 2
Body weight, blood pressure, exercise, and depression in adults trained in developmental skills at baseline and at 3, 6, 12, and 24 months, and mean difference between baseline and 24 months

Variable	Baseline (mean±SD[a])	Change at 3 mo		Change at 6 mo		Change at 12 mo		Change at 24 mo		Mean difference between baseline and 24 mo[c]	
		Mean	95% CI[b]	Mean	95% CI[b]	Mean	95% CI[b]	Mean	95% CI[b]	Mean	95% CI[b]
Weight (kg)	93.0±18.8	−4.2	−12.1, 3.7	−6.0	−19.9, 7.9	−7.0	−28.9, 13.0	−7.9	−28.9, 13.0	−7.9	−12.5, −3.3**
Systolic blood pressure (mm Hg)[d]	134.8±4.2	−7.3	−42.9, 28.3	. . .	. . .	. . .	. . .	−13.8	−38.0, 10.4	−13.8	−22.9, 4.7*
Diastolic blood pressure (mm Hg)[d]	93.3±10.5	−6.4	−25.2, 12.4	. . .	. . .	. . .	. . .	−15.1	−31.9,1.7	−15.1	−21.8, −8.4***
Exercise (min/wk)	103.4±134.0	138.4	204.2, 481.0	+109.3	−231.3, 449.9	+140.5	−211.9, 492.9	+189.1	−398.0, 776.2	+189.1	109.5, 269.7***
Depression[e]	6.4±4.6	−3.7	−8.2, 0.8	. . .	. . .	. . .	. . .	−2.6	−14.9, 9.7	−2.6	−6.2, 1.0

[a]SD=standard deviation.
[b]95% confidence intervals (CI) calculated as $x\pm(2.074\times SD)$ for n=22 or as $x\pm(2.16\times SD)$ for n=13 for changes at each interval. Confidence intervals for mean difference calculated using standard error of the mean.
[c]Mean difference between baseline and 24-month values: *$P<.02$; **$P<.01$; ***$P<.001$.
[d]Number of study subjects for this variable=13. Number of study subjects for all other variables=22.

of the initial weight loss. Our study suggests that developmental skills training may produce sustained weight loss after 18 sessions rather than the 72 sessions reported in the study of Perri et al (38). Continuous-care models of obesity treatment may be adaptations to the low effectiveness of the method rather than to the intractability of obesity.

The changes in blood pressure observed in our study are consistent with those seen in other weight-loss studies (46,47). The reliability of the blood pressure measures may be diminished because of irregularities in measurement procedures, including the use of different evaluators, instruments, and situations in which data were collected; nevertheless, the changes were substantial.

Total time spent in exercise per week increased at 3 months. That increase diminished somewhat at 6 months, then increased again at 12 and 24 months. Exercise has been associated with weight maintenance (48,49), so the increased exercise may contribute to the continued weight loss observed in this sample.

Mean depression score decreased from 6.4 at baseline to 2.7, 58%, at 3 months; 71% of this change was sustained at 24 months (mean score=3.8). Except for two participants who at baseline were taking antipsychotic drugs and had severe depression scores at one or more data collection periods, scores for all participants were consistent with mild or no depression at both 3 and 24 months. The five moderately depressed participants no longer had depressive symptoms and attitudes by 3 months, and this change persisted at 24 months. The two participants who had scores indicating severe depression at one or more data collection periods were severely depressed at 24 months. The intervention appears to be effective in alleviating depression in the moderately depressed, but it may not improve the symptoms and attitudes of depression in the severely depressed.

Most participants reported a broad spectrum of improvements in their functioning, which is consistent with the theoretical base of this method. Of those who used substances initially, most reported decreasing or stopping use at both 12 and 24 months of the study. For example, one subject who initially consumed 10 servings of alcoholic beverages per week decreased her intake to 2 servings per month at 24 months; another subject decreased smoking from two packs per day to one half pack per day during the same period. Of particular interest was that none of these participants enrolled in organized treatment programs for substance use cessation. All reported that the change in substance use resulted from a decrease in desire for the substance; this finding is consistent with the theoretical model of the intervention, that is, that these developmental skills promote a broad range of adaptive behaviors and decrease the desire to engage in maladaptive behaviors. In addition, most participants reported a spiritual deepening at 2 years, even though there is no explicit spiritual content in this training. One possibility is that as participants practiced these internal skills they became more internally oriented, a characteristic thought to enhance spirituality. This finding is of particular interest because the mean weight loss of subjects in this study who reported a deepening of spirituality was seven times greater than the mean weight loss of those who indicated no change or a decrease in spirituality.

The limitations of the generalizability of this study include the small sample size, the underrepresentation of men and minorities, the absence of a control group and randomization, and the use of self-reported data for exercise and functioning. Although professional training to deliver this intervention in a standardized way has been developed and disseminated (31), the results achieved by other providers at other sites may differ from those in this study.

Table 3
Changes in participants in developmental skills training at 12 and 24 mo[a]

	12 mo		24 mo	
	No.	%	No.	%
Health Indexes				
Maintained a weight loss	19/22	86	17/22	77
Improved health/vitality	16/22	73	17/22	77
Decreased blood pressure[b]	4/22	32	9/13	69
Exercised more	20/22	91	15/22	68
Used substances less[c]	6/9	67	8/9	89
Psychosocial, vocational, and economic functioning				
Improved mood/happiness	20/22	91	20/22	91
Improved relationships	19/22	86	19/22	86
Deepened spirituality	. . .	. . .[d]	16/22	73
Coped better at work	. . .	. . .	19/22	86
More productive at work	. . .	. . .	12/22	54
Spent more responsibly	. . .	. . .	13/22	59
Saved more money	. . .	. . .	9/22	41

[a]All data based on questionnaires and structured interview at 2 years, except blood pressure and weight data, which were collected using standard methods.
[b]For 13 subjects for whom data were available and for whom both systolic and diastolic blood pressures decreased 5 mm Hg or more.
[c]For 9 subjects who used substances and who reported stopping or substantially reducing use (2 smoked, 4 consumed more than seven servings of alcoholic beverages per week, one used marijuana only, two used marijuana and consumed more than seven servings of alcoholic beverages per week).
[d]Data not available for this aspect of functioning at 12 months.

The strengths of our study included the low attrition rate and the design of following up subjects for 2 years and using repeated measures. In the study of Skender et al (2), the dropout rate was 32%, and 29% of those who completed the program did not return for follow-up; these are much higher than the rates of 14% and 10%, respectively, observed in our study. Other strengths of the study are the breadth of variables studied and the coherence of the results with the theory on which the study was based. Upon clinical evaluation by program providers after treatment, 4 of the 22 subjects demonstrated no notable mastery of these developmental skills. At the 2-year follow-up, the 4 subjects who had not mastered the skills showed few sustained changes in any of the variables studied. In contrast, the 18 subjects who demonstrated skill in using The Solution Method showed consistent changes in weight, blood pressure, exercise, depression, and functioning. Larger scale, controlled studies of the method are needed.

APPLICATIONS

Traditionally, dietitians are the members of the health care team who treat obesity. Potential barriers to maintaining or expanding this role are the poor long-term effectiveness of behavioral treatments (50) and perceptions that dieting can stimulate binge eating behavior and that enrollment in weight-loss programs with low effectiveness can result in a sense of failure that negatively affects the psychosocial functioning of the obese. This article suggests that a developmental skills training approach such as The Solution Method may provide dietitians with a new model of weight-loss treatment that responds to these concerns, including demonstrating evidence of long-term effectiveness without dietary restriction and producing a beneficial rather than deleterious effect on psychosocial functioning. ■

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