

# Motivational Interviewing to Improve Adherence to a Behavioral Weight-Control Program for Older Obese Women With NIDDM

## A pilot study

DELIA E. SMITH, PHD  
CHRISTINE M. HECKEMEYER, MD

POLLY P. KRATT, MSPH  
DEHYRL A. MASON, PHD

**OBJECTIVE** — The aim of this randomized pilot study was to examine whether the addition of motivational interviewing strategies to a behavioral obesity intervention enhances adherence and glucose control in older obese women with NIDDM.

**RESEARCH DESIGN AND METHODS** — Twenty-two older obese women (41% black) with NIDDM were randomly assigned to 1) a standard 16-week group behavioral weight-control program that provided instruction in diet, exercise, and behavior modification or 2) the same group behavioral program with three individualized motivational interviewing sessions added.

**RESULTS** — The motivational group attended significantly more group meetings (13.3 vs. 8.9), completed significantly more food diaries (15.2 vs. 10.1), and recorded blood glucose significantly more often (46.0 vs. 32.2 days) than the standard group. Further, participants in the motivational group had significantly better glucose control post-treatment (9.8 vs. 10.8%). Although both groups demonstrated significant weight loss, no differences were apparent between groups.

**CONCLUSIONS** — These results suggest that augmenting a standard behavioral treatment program for obese women with NIDDM with a motivational interviewing component may significantly enhance adherence to program recommendations and glycemic control. Preliminary data warrant further investigation with larger samples and a longer follow-up.

Treatment recommendations for obese individuals with NIDDM to change diet and exercise behaviors present a challenge for both patient and providers (1). Following these lifestyle recommendations may be more problematic than other aspects of diabetes self-care (2). Multicomponent behavioral weight-control programs have been shown to significantly improve metabolic control among overweight patients with NIDDM (1,3), but failure to adhere to the program recommendations can attenuate success (4).

Motivational interviewing (5) is a brief intervention that derives from a social cognitive theoretical framework (6) and is designed to augment an individual's motivation to change problematic behaviors. It has been shown effective in changing behaviors that can be difficult to modify, such as drinking habits (7,8). Improvements among problem drinkers who received motivational interviewing appeared to be mediated by increased adherence to a standard alcoholism treatment program (9). The purpose of the current study was to examine whether the

addition of motivational interviewing to a behavioral weight-control program for obese women with NIDDM enhances adherence to the program and improves post-treatment glycemic control.

## RESEARCH DESIGN AND METHODS

### Participants

Women with NIDDM aged 50 years or older whose weight was 120 to 200% of ideal (10) were recruited by advertisement and patient letter. Exclusion criteria included the following: 1) taking insulin, 2) cardiovascular disease, and 3) inability to walk for exercise.

### Treatment conditions

**Standard behavioral weight control (standard).** The 16-session group behavioral weight-control program was conducted by a team of interventionists that included a nutritionist, three psychologists (one licensed and two interns; all three were experienced in obesity treatment), and an exercise physiologist. Moderate calorie restriction (1,200–1,500 kcal/day), fat gram recommendations (30–40 g/day), increased physical activity, and home monitoring of blood glucose were recommended. Weekly group meetings provided nutritional information and training in behavior modification of eating and exercise. Self-monitoring was a critical component of the program. Participants recorded daily calorie consumption and physical activity in diaries. Home blood glucose monitoring machines (One Touch II, Lifescan, Inc.) were furnished, and fasting blood glucose was recorded 3 times a week. Diaries were collected at each group meeting, reviewed by program staff, and returned with feedback about diet, physical activity, and glucose control.

**Behavioral weight control with motivational interviewing (motivational).** The

From the Department of Medicine, the University of Alabama at Birmingham School of Medicine, Birmingham, Alabama.

Address correspondence and reprint requests to D.E. Smith, PhD, Behavioral Medicine Unit, 1717 11th Avenue South, Suite 401, Birmingham, AL 35205. E-mail: dsmith@bmu.dopm.uab.edu.

Received for publication 12 March 1996 and accepted in revised form 2 August 1996.

ANOVA, analysis of variance; ANCOVA, analysis of covariance.

Table 1—Mean post-treatment characteristics of weight-reduction groups

	Standard	Motivational	P value
n	10	6	
Treatment sessions attended	8.9 ± 2.9	13.3 ± 2.0	0.01*
Food diaries submitted	10.1 ± 2.6	15.2 ± 1.8	0.01*
Self-monitored blood glucose (days)	32.2 ± 10.2	46.0 ± 16.1	0.05*
Reported exercise (days)	23.7 ± 11.6	35.2 ± 13.2	0.07*
Recorded calories (days)	55.7 ± 24.7	76.8 ± 15.2	0.07*
Glycemic control (% GHb)	10.8 ± 3.1	9.8 ± 1.3	0.05†
Weight loss (kg)	4.5 ± 2.2	5.5 ± 3.9	—†

Data are means ± SD. \*Kruskal-Wallis test. †Analysis of covariance adjusted for baseline.

weight reduction and the home blood glucose monitoring components of the motivational group were identical to those for the standard group. To minimize differential delivery of the program and assure that comparable material was presented in both conditions, group sessions followed the same written protocol. In addition to the group sessions on modifying eating and exercise habits, participants had three individual motivational interviewing sessions (one at the beginning and two at midtreatment). Individual motivational interviewing sessions were conducted by psychologists experienced in motivational interviewing techniques (one senior and one junior; half of the patients were followed by each). Motivational interviews explored ambivalence about behavior change, elicited personal goals and self-motivational statements from participants, formulated personal goals in behavioral terms, and problem-solved barriers to change. The discrepancy between a participant's stated goals and her current behavior was examined in a style that increased motivation for change by highlighting participant-generated benefits of change and reducing the perceived costs of change, while supporting self-efficacy to perform the steps necessary for behavior change. A review of objective data (e.g., glycemic control, cardiovascular risk factor status, and behavioral performance) was used to help develop discrepancy between current status and desired goals. Following a guiding principle of motivational interviewing, argumentation and resistance were avoided by refraining from direct confrontation. Participants were not told all the reasons to change; rather, open-ended questions and reflective listening were used to elicit expressions of concern from the participant about current status and recognition of advantages to changing. Then, her own words were used to summarize, with

an acknowledgment of reasons not to change and an emphasis on her reasons to change. Realistic and objective goals were then developed collaboratively.

#### Measures

**Treatment outcome.** Baseline and post-treatment (4-month) assessments were conducted by trained technicians blind to group assignment. Body weight was measured on a balance beam scale and BMI (weight [kilograms]/height [meters]<sup>2</sup>) was calculated. GHb was collected using ion exchange liquid chromatography to assess glycemic control over the previous 6 to 8 weeks.

**Treatment adherence.** Behavioral measures of adherence monitored throughout the program included attendance at group meetings, number of diaries turned in, number of days calories were recorded, exercise frequency, and number of days home blood glucose was monitored.

#### Data analysis

Analysis of variance (ANOVA) and Fisher's exact test were used to determine whether the groups differed in attrition or demographic characteristics. Analysis of covariance (ANCOVA) was conducted to compare groups on glucose and weight, covarying the baseline value. In addition, Kruskal-Wallis analyses were done on the changes in weight and glucose. Since both approaches yielded similar results, only the ANCOVA results are reported. Kruskal-Wallis analyses were used to examine treatment adherence. Version 6.04 of the SAS software package (SAS Institute, Cary, NC) was used, and all P values were two-tailed.

#### RESULTS

##### Sample

The 22 women (41% black) randomized

had a mean age of 62.4 ± 7.0 years and mean baseline BMI of 34.7 ± 4.9. Average diabetes duration was 6.7 ± 5.4 years, and mean baseline GHb was 10.25 ± 2.2%, indicating compromised glucose control. The sample used for data analysis included 16 women. Five women were lost to attrition: two because of schedule conflicts that arose after groups began and three because of personal (or family member) hospitalizations that interfered with attendance. One participant was omitted because she began insulin treatment. There were no differences between the standard and motivational groups in attrition. Dropouts tended to be younger (54.6 vs. 64.1 years,  $F [1,19] = 9.06$ ,  $P = 0.007$ ) and have poorer glycemic control (11.6 vs. 9.6%,  $F [1,19] = 4.44$ ,  $P < 0.05$ ) than those who completed treatment. There were no differences in baseline weight, duration of diabetes, or race between dropouts and completers.

##### Treatment adherence measures

The motivational group demonstrated better adherence to the program than the standard group (Table 1). The motivational group had higher attendance ( $\chi^2 = 6.36$ ,  $P = 0.01$ ), turned in more diaries ( $\chi^2 = 9.10$ ,  $P = 0.003$ ), and monitored their blood glucose more often ( $\chi^2 = 3.82$ ,  $P = 0.05$ ). Additionally, the motivational group demonstrated a tendency toward a greater number of days exercised ( $\chi^2 = 3.21$ ,  $P = 0.07$ ) and caloric intake recorded ( $\chi^2 = 3.21$ ,  $P = 0.07$ ).

##### Glycemic control and weight loss

As can be seen in Table 1, motivational participants achieved better glucose control following treatment than the standard weight-control group ( $F [1,13] = 6.48$ ,  $P = 0.02$ ). Both groups lost significant amounts of weight during treatment ( $t = 6.78$ ,  $P < 0.0001$ ), although the groups did not differ significantly.

**CONCLUSIONS** — These pilot data suggest that the addition of motivational interviewing to a standard behavioral weight-control program may significantly enhance adherence to treatment recommendations and glycemic control. Although weight loss did not differ between groups, differences were in the expected direction, and the small sample size offered minimal power to detect differences in weight change. The consistent and robust findings of this preliminary

study warrant a full-scale trial to evaluate motivational interviewing strategies to promote adherence to behavioral interventions and enhance glycemic control. Future investigations will require longer follow-up, larger and more diverse samples, and controls to minimize any confounding from unequal therapist contact.

**Acknowledgments**— This research was supported in part by a University of Alabama at Birmingham, Center for Aging grant to DE Smith. Portions of this research were presented at the 28th Annual Meeting of the Association for the Advancement of Behavior Therapy, 1994.

We gratefully acknowledge the contributions of Elizabeth Kitchin, MS, RD, Sheryl Jackson, PhD, and Paul Greene, PhD. In

addition, we are indebted to Lifescan, Inc. for the One Touch II glucose meters.

#### References

1. Cox DJ, Gonder-Frederick L: Major developments in behavioral diabetes research. *J Consult Clin Psychol* 60:628-638, 1992
2. Kravitz RL, Hays RD, Sherbourne CD, DiMatteo MR, Rogers WH, Ordy J, Greenfield S: Recall of recommendation and adherence to advice among patients with chronic medical conditions. *Arch Intern Med* 153:1869-1878, 1993
3. Wing RR: Behavioral treatment of obesity. *Diabetes Care* 16:193-199, 1993
4. Smith DE, Wing RR: Diminished weight loss and behavioral compliance during repeated diets. *Health Psychol* 10:378-383, 1991
5. Miller WR, Rollnick S: *Motivational Interviewing: Preparing People to Change Addictive Behavior*. New York, Guilford, 1991
6. Bandura A: *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ, Prentice-Hall, 1986
7. Bien TH, Miller WR, Borrough JM: Motivational interviewing with alcohol outpatients. *Behav Cognit Psychotherapy* 21:347-356, 1993
8. Miller WR, Benefield RG, Tonigan JS: Enhancing motivation for change in problem drinking: a controlled comparison of two therapist styles. *J Consult Clin Psychol* 61:455-461, 1993
9. Brown JM, Miller WR: Motivational interviewing on participation and outcome in residential alcoholism treatment. *Psychology Addictive Behav* 7:211-218, 1993
10. Metropolitan Life Insurance Company: Metropolitan height and weight tables. *Stat Bull Metrop Life Insur Co* 64:2-9, 1983