

# Training Dietitians in Basic Motivational Interviewing Skills Results in Changes in Their Counseling Style and in Lower Saturated Fat Intakes in Their Patients

Johannes Brug, PhD, MSc<sup>1</sup>; Femke Spikmans, MPH, RD<sup>2</sup>; Cora Aartsen, RD<sup>2</sup>; Boudewijn Breedveld, MSc<sup>2</sup>; Rik Bes, MSc<sup>3</sup>; Isabel Ferreira, PhD, MSc<sup>1</sup>

## ABSTRACT

**Objective:** To test if basic training for dietitians in motivational interviewing (MI) resulted in changes in dietitians' counseling style and improvements in their patients' diet and risk parameters.

**Design:** A randomized controlled trial.

**Setting:** 9 home-care organizations in the Netherlands.

**Participants:** 37 dietitians, 209 baseline patients, and 142 follow-up diabetes patients.

**Intervention:** Dietitians were randomly allocated to receive basic training in motivational interviewing (MI dietitians, n=18) or not (control dietitians, n=19).

**Main Outcome Measures:** Counseling style of dietitians; total self-reported saturated fat, fruit, and vegetable intake, measured body mass index (BMI), waist circumference, and glycated hemoglobin (Hemoglobin A<sub>1c</sub>, HbA<sub>1c</sub>) of patients.

**Analysis:** Analyses of variance and multiple linear regression analyses. Alpha = .05

**Results:** MI dietitians were significantly more empathetic, more often showed reflection during consultations, and were more likely than control dietitians to let their patients talk for the majority of the consultation. Patients of MI dietitians had significantly lower saturated fat intake levels at posttest compared to patients of control dietitians. No effects on HbA<sub>1c</sub>, BMI, and waist circumference were found.

**Conclusions and Implications:** Basic training in MI changed the dietitians' counseling style and resulted in lower saturated fat intakes in their patients.

**Key Words:** motivational interviewing, dietitians, diabetes patients

(*J Nutr Educ Behav.* 2007;39:8-12)

## INTRODUCTION

Since maintaining a healthful diet is of major importance for diabetes management,<sup>1</sup> diabetes diet counseling is part of standard diabetes treatment and is covered by health insurance in the Netherlands. Nevertheless, many patients appear to fail to comply with dietary advice, may not

appreciate the dietary advice provided by dietitians, and often fail to keep appointments with their dietitians.<sup>2</sup>

In line with a need for a more patient-centered approach in patient education, motivational interviewing (MI)<sup>3,4</sup> and MI-based, patient-centered behavior change consultation<sup>5</sup> show promise as a means to improve health and nutrition counselling.<sup>6-8</sup> Motivational interviewing builds on stages of change theory and self-determination theory.<sup>4</sup> Motivational interviewing facilitates patients resolving their ambivalence about behavior change and avoids confrontation between patient and counselor.<sup>3,5</sup> Motivational interviewing encourages patients to express thoughts, feelings, and ambivalence, so that they reach a decisional balance, choose what to change, and decide on a change plan and strategy. The counselor should help to explore resistance to change, since exploring and explaining such resistance is seen as a first step toward change.<sup>3,5</sup> In MI, direct advice is provided only if the patient asks, and it

This study was financially supported by The Netherlands Organization for Health Research and Development.

<sup>1</sup>Department of Public Health, Erasmus University Medical Center, Rotterdam, The Netherlands

<sup>2</sup>Netherlands Nutrition Center, The Hague, The Netherlands

<sup>3</sup>Center for Motivation and Change, Hilversum, The Netherlands

Author for correspondence: Johannes Brug, Department of Public Health, Erasmus University Medical Center, P.O. Box 2040, 3000 CA Rotterdam, The Netherlands; Tel.: +31 10 4638460; Fax: +31 10 4638475; E-mail: j.brug@erasmusmc.nl

©2007 SOCIETY FOR NUTRITION EDUCATION

doi: 10.1016/j.jneb.2006.08.010

is formulated as neutrally as possible.<sup>8,9</sup> Since MI aims to let the patient explore ambivalence, motivation, and possibilities to change, the patients should talk more than the dietitian during counseling.<sup>3,5</sup>

However, there is a lack of trials that have tested the effects of the MI approach in diet counselling.<sup>6,8</sup> The present study explored whether training dietitians in basic MI skills changed the dietitians' counseling practices and their patients' diets, body mass index (BMI), waist circumference (WC), and glycated hemoglobin (Hemoglobin A<sub>1c</sub>, HbA<sub>1c</sub>) levels. (Hemoglobin A<sub>1c</sub> is also known as glycated hemoglobin. The level of HbA<sub>1c</sub> reflects the average blood glucose level over the past 3 months.)

## METHODS

### Study Design, Respondents and Procedure

Thirty-seven specialized diabetes-care dietitians (this is a common specialization among dietitians in the Netherlands) working for 9 Dutch home-care organizations (diabetes diet care in the Netherlands is mainly provided through these organizations), were recruited and randomly allocated to receive either MI training (18 dietitians) or not (19 dietitians). Recruitment of dietitians took place via the home-care organizations where they worked. Managers of home-care organizations were asked for their cooperation. If the home-care organization agreed, the dietitians were informed about the content and procedure of the study. None of the dietitians refused to participate. Participating dietitians held bachelor's degrees in dietetics, were between 24 and 45 years old, and had 2 to 20 years experience. Motivational interviewing training took place between March and September 2003. From September 2003 on, all participating dietitians requested informed consent from newly diagnosed patients referred to them for the first time. The dietitians were encouraged to include up to 10 patients. A power analysis revealed that 140 patients needed to be included to detect a difference in BMI reduction of 0.75 between intervention and the control group, with power = 0.8, alpha = .05, assuming almost stable BMI in the control group. Enrollment stopped after 8 months, when a sufficient number of patients had been included (n=192) to allow some dropout between baseline and follow-up. The number of patients ranged from 1-9 (mean = 6) and from 12 to 29 between dietitians and centers, respectively; 40% of patients refused to participate. No information was collected on why some patients refused to participate. In line with national standards, participating patients had 4 or 5 counseling sessions during the study; the duration of the first counseling session was between 30 and 45 minutes, and the mean duration of the follow-up sessions was 15 minutes. Although there is no evidence-based information on the optimal number and duration of sessions, the number and duration of sessions are defined by national standards and were not different between MI and control dietitians. The study was approved by the Netherlands Organization for Health Research and Development (No. 32250006).

## MI Training

The MI training was developed and conducted in several steps. First, co-author RB, one of the members of the global Motivational Interviewing Network of Trainers (MINT), trained the study coordinator (i.e., the second author FS) and a senior diabetes-care dietitian in MI theory and practice. This training consisted of 2 1-week training sessions. The first week was an introductory training, the second week a "train the trainers" course. Subsequently, the senior dietitian, FS, and RB developed, in close collaboration with a small group of other specialized diabetes-care dietitians, a 2-day, basic MI skills training specifically tailored to dietitians working in diabetes diet counseling.

Next, the 18 dietitians allocated to MI received the MI training in 2 groups in March 2003 and subsequently started applying MI in their daily practice. The training took 2 days. The first day consisted of an introduction to MI theory and principles, as outlined in the introduction. The second day consisted mostly of practicing MI skills. The MI dietitians further participated in a 1-day follow-up workshop in May 2003 to discuss their initial experiences with the experts and to refresh their MI knowledge and skills. Finally, they received on-demand feedback and advice on MI-related issues by the senior dietitian and FS, supervised by RB until September 2003, when the actual study started.

## Data Collection and Measures

Data were collected among dietitians and their patients. For each participating dietitian, 2 consultations were tape-recorded, the first within 1 month after MI dietitians received their training and the second between 5 and 6 months postbaseline. Transcripts were made of the first 15 minutes of the tape; names and other privacy information of dietitians and patients were deleted from the transcripts. RB, who was blinded as to which transcripts were from MI dietitians, analyzed the transcripts with the Motivational Interviewing Treatment Integrity (MITI) code<sup>10</sup> and the Manual for the Motivational Interviewing Skill Code (MISC) version 2.0.<sup>11</sup> These 2 MI evaluation codes are based on precoded forms used by an evaluator specifically trained for this task. The evaluator first reads the full transcript and subsequently goes through the transcripts once for each MI-relevant criterion to score each dietitian on each of the specific MI-relevant counseling style criteria, such as the proportion of time of the consult that the patient talked, the empathy and the number of reflections shown by the dietitian, how many open- and closed-ended questions were asked by the dietitian, and how many change statements the patient made (see Table 1 for a list of criteria).

Patients completed baseline and follow-up self-administered, written questionnaires on intake of saturated fat, fruits, and vegetables, and motivation and self-efficacy to maintain a healthful diet. These questionnaires were given to the patients by their dietitians in closed envelopes,

**Table 1.** Mean (SD) Scores on Motivational Interviewing (MI) Relevant Counseling Criteria in Dietitians Who Received MI Training (MI Dietitians) or Not (Controls)

MI-relevant Counseling Criterion (Range)	First Test			Second Test		
	MI Dietitians Mean (SD) (N=18)	Controls Mean (SD) (N=19)	P for Difference Between Groups	MI Dietitians Mean (SD) (N=18)	Controls Mean (SD) (N=19)	P for Difference Between Groups
Empathy; 1 (low) –7 (high)	4.6 (1.1)	4.0 (1.2)	.15	4.4 (1.1)	3.1 (0.8)	.01
MI spirit; 1 (low) –7 (high)	3.8 (1.2)	3.3 (1.5)	.27	4.1 (1.3)	2.5 (1.1)	.01
MI adherence; 1 (low) –17 (high)	9.4 (5.4)	6.6 (6.1)	.15	6.4 (4.0)	6.9 (4.7)	.75
MI infidelity; 1 (low) –17 (high)	1.2 (1.7)	3.2 (2.9)	.02	1.6 (3.7)	3.8 (4.0)	.01
Number of closed questions (2-31)	16.4 (7.7)	14.1 (7.6)	.36	12.3 (6.4)	11.9 (7.0)	.86
Number of open questions (0-12)	4.4 (3.4)	3.6 (2.9)	.46	4.2 (3.0)	3.9 (3.0)	.79
Total number of questions (3-38)	20.8 (8.8)	17.6 (7.9)	.26	16.5 (8.7)	15.8 (8.7)	.82
Number of simple reflections (1-20)	9.3 (3.7)	6.0 (4.6)	.09	10.6 (5.0)	6.5 (3.0)	.01
Number of complex reflections (0-5)	1.7 (2.8)	0.7 (0.8)	.15	1.2 (1.8)	0.3 (0.6)	.06
Total number of reflections (1-22)	10.9 (4.3)	6.9 (5.3)	.02	11.8 (5.9)	6.8 (3.2)	.01
Number of change statements (0-11)	2.0 (1.8)	1.6 (3.3)	.62	3.6 (3.3)	1.1 (1.3)	.01
	%	%		%	%	
Patient and not the dietitian talks for majority of time	55.6	5.6	.00	50.0	6.7	.00

and after completion, the questionnaires were sent directly to the research center. Written instructions accompanied the questionnaires, but no specific administration training was provided. Additionally, height and weight (to calculate BMI) and WC were measured, and the most recent measurement of HbA<sub>1c</sub> was recorded from the patient's record. These measurements were up to 6 weeks old.

Saturated fat<sup>12</sup> and fruit and vegetable intakes<sup>13,14</sup> were assessed with validated, self-administered written food frequency questionnaires (FFQ) that have been used in nutrition education evaluation research before.<sup>15-17</sup> For the saturated fat FFQ, the relative validity as compared with 7-day records was assessed ( $r=0.69$ ;  $P<.001$ ); for the fruit and vegetable FFQ, 7-day records ( $r=.51$  to  $.79$ ;  $P<.001$ ) as well as biomarker validation was established (blood levels of total carotenoids [ $r=.34$ ;  $P<.001$ ], vitamin C [ $r=.27$ ;  $P<.001$ ], and beta-cryptoxanthin [ $r=.42$ ;  $P<.001$ ]).<sup>14</sup> The saturated fat FFQ asks about frequency and amount of food items contributing most to total intake of saturated fat in the Dutch diet.<sup>12</sup> Since not all sources of dietary saturated fat or energy are included in the FFQ, a saturated fat score between 0 and 80, reflecting total saturated fat intake, is calculated instead of grams or percent energy from saturated fat. Based on the fruit and vegetable FFQ intakes in grams per day were calculated.<sup>13-14</sup> Weight and height were measured by the dietitians using their office equipment. Waist circumference was measured with standard tape measures provided to all dietitians by the Netherlands Nutrition Bureau at the level midway between the lowest rib margin and the iliac crest, with patients in standing position at the end of a gentle expiration.<sup>18</sup>

## Data Analysis

One-way analysis of variance and chi square tests were conducted to study differences in counseling style characteristics between MI dietitians and control dietitians. Baseline differences between MI patients and controls were examined with logistic regression analyses. Paired t tests were used to explore significant differences in all patient outcome indicators between baseline and posttest.

Multiple linear regression analyses were conducted with patients' posttest saturated fat intake, BMI, WC, and HbA<sub>1c</sub> level as dependent variables and group (MI=1, no MI=0), baseline level of the dependent variable, sex, and age as independent variables to test the impact of MI training. Group X sex and group X age interaction effects were also analyzed in order to explore if the analyses should be stratified by sex or age group.

## RESULTS

At both recordings, MI dietitians complied better with MI criteria. They scored higher on total number of reflections made, and they were less likely to talk for the majority of the time of the consultation (Table 1). Additionally, at the second test, MI dietitians showed more empathy, induced more change statements, and scored higher on the "MI spirit" scale (which summarizes to what extent dietitians indeed used an MI counseling style) than controls.

Dropout among patients was 26% and was not associated with study group, sociodemographics, diet, self-efficacy, intentions, BMI, WC or HbA<sub>1c</sub>. Mean (SD; range)

age of the patients who completed the study was 59 (10; 28-84), of whom 57% had completed primary school, lower vocational training or less, and 10% had college or university training. No baseline differences in demographics or risk factors were found between the study groups.

Patients in both study groups improved their saturated fat intake levels, BMI, WC, and HbA<sub>1c</sub> between baseline and posttest. MI patients, but not control patients, also increased their fruit intakes significantly. No significant changes in vegetable intakes were found between baseline and posttest (Table 2).

No significant group X sex or group X age interaction effects were found. In the multiple regression analyses, group (standardized regression coefficient [ $\beta$ ]=.23;  $P$ =.00) was significantly associated with saturated fat intake at posttest, indicating that patients from MI dietitians had lower mean saturated fat intake levels at posttest than control patients. No significant group effects on fruit intake ( $\beta$ =-.07;  $P$ =.46), vegetable intake ( $\beta$ =.04;  $P$ =.77), BMI ( $\beta$ =.00;  $P$ =.92), WC ( $\beta$ =-.03;  $P$ =.46), or HbA<sub>1c</sub> ( $\beta$ =.01;  $P$ =.91) were found.

## DISCUSSION

The present study indicates that brief training in MI can induce changes in counseling style among dietitians working in diabetes care. This study further shows that such training is associated with significantly larger changes in self-reported saturated fat intake scores in patients who were recently diagnosed with diabetes and therefore referred to a dietitian. However, there was no evidence that the MI training resulted in larger changes in other important diabetes-related health risk indicators, such as body mass and glycemic control, than usual care.

This study is one of few studies using a randomized trial and including risk biomarkers to test MI in diet counseling for diabetes patients. One other study testing MI in diabetes patients reported a significant impact of adding MI to regular behavioral counseling for monitoring of blood glucose levels and program adherence, but not for weight

loss.<sup>19</sup> This was a pilot study among 22 older, obese women who were randomly assigned to receive additional MI next to a standard 16-week group behavior weight-control program. Treatment adherence was based on registration of attendance at group meetings, the number of self-monitoring diaries that were handed in, and self-reported number of days blood glucose was monitored at home.

A recent review of the literature showed that the strongest evidence for the efficacy of MI comes from studies on problem drinking and smoking.<sup>8</sup> A review of the effects of MI on diet modifications identified 5 studies, 1 of which reported on changes in fat intakes (2.7% reduction).<sup>6</sup> In the present study, a 14% larger reduction in saturated fat intake was found for MI patients compared with controls.

Training dietitians or other practitioners in MI does not guarantee actual application of MI, and the efficacy of MI may depend largely on the level of competency and proficiency of the practitioners when applying the method. With 16 to 24 hours of training contact time, it is possible to provide participants with an understanding of the spirit and method of MI, and to offer some practical experience in trying out this patient-centered counseling approach. However, such relatively short introductory workshops may leave practitioners overconfident in their mastery of MI.<sup>20</sup> Adding opportunities for personal performance feedback (e.g., from practice audiotapes) and/or individual coaching can significantly increase the effectiveness of MI training.<sup>21</sup> In his commentary on one of the recent MI reviews,<sup>7</sup> Miller argued that appropriate assessment of MI practice is necessary in studies on MI in order to explore the effects of "true" MI practice, and that direct monitoring of practice is the gold standard, since self-reports of the MI practitioners are unreliable.<sup>20</sup> Such direct monitoring in this study was performed by means of tape recordings of counseling sessions, and based on the analyses of these recordings, evidence was found that the dietitian trained in MI indeed used a different counseling style that was in line with the overall spirit as well as specific criteria of MI.

The present study had its limitations. The study was conducted in specific regions of the Netherlands, which

**Table 2.** Means (SD) for the Main Outcome Variables at Baseline and Posttest for Patients Counseled by Dietitians Who Either Received Motivational Interviewing Training (MI Patients) or Not (Control Patients)

MI-relevant Counseling Criterion	MI Patients (N=83)			Control Patients (N=59)		
	Baseline Mean (SD)	Posttest Mean (SD)	P for Difference	Baseline Mean (SD)	Posttest Mean (SD)	P for Difference
Saturated fat score (points)	19.8 (6.7)	15.8 (4.9)	.00	19.9 (6.4)	18.4 (5.5)	.05
Vegetable intake (grams)	165 (93)	180 (109)	.46	160 (77)	171 (84)	.43
Fruit intake (grams)	226 (158)	261 (178)	.03	245 (162)	247 (134)	.95
BMI (kg/m <sup>2</sup> )	30.7 (5.7)	29.6 (5.5)	.00	29.8 (4.3)	28.7 (4.0)	.00
WC (cm)	105 (13)	102 (13)	.00	107 (12)	103 (12)	.00
HbA <sub>1c</sub>	8.0 (2.0)	6.7 (1.0)	.00	7.5 (1.7)	6.5 (0.9)	.00

BMI indicates body mass index; WC, waist circumference; HbA<sub>1c</sub>, hemoglobin A<sub>1c</sub>, an indicator of blood glucose levels over the past 2 to 3 months

may limit the external validity of our results. Baseline BMI (30.7 vs. 28.4) and HbA<sub>1c</sub> (7.7 vs. 6.5) in the present study were somewhat higher than found in diabetes patients in the Hoorn Study, a large Dutch population-based longitudinal study on diabetes risk,<sup>22</sup> which may indicate that especially higher risk patients were enrolled in the present study. Finally, the present study was conducted among a relatively small sample of diabetes patients, and part of the results rely on self-report measures that may be biased.

## IMPLICATIONS FOR RESEARCH AND PRACTICE

Although this study provides some evidence for MI's efficacy in inducing changes in dietary saturated fat intakes, both the MI and the control groups showed significant and relevant improvements over time in BMI, WC, and HbA<sub>1c</sub>. This finding may be an indication that standard diet counseling of diabetes patients is as effective as MI in reducing these risk factors, at least for patients recently diagnosed with diabetes. Further research should study whether MI becomes more relevant after diabetes patients have more experience with the difficulties of maintaining a healthy lifestyle. The conclusion is that training dietitians in basic MI skills resulted in changes in dietitians' counseling styles and possible improvements in their patients' saturated fat intakes, but no evidence was found for effects of MI on fruit and vegetable intakes, glycemic control, and body mass. Further research is needed to test applying MI techniques in diet counseling, and in nonclinical settings. Earlier studies have indicated that the MI technique may also be relevant for primary prevention.<sup>4</sup> If such further studies confirm that MI improves the effects of diet counseling, more dietitians or other health professionals should be trained in MI.

## ACKNOWLEDGMENT

This study was financially supported by the Netherlands Organization for Health Research and Development.

## REFERENCES

1. Parillo M, Riccardi G. Diet composition and the risk of type 2 diabetes: epidemiological and clinical evidence. *Br J Nutr*. 2004;92:7-19.
2. Spikmans FJM, Brug J, Doven MMB, Kruizinga HM, Hofsteenge GH, van Bokhorst-van der Schueren MAE. Why do diabetic patients not attend appointments with their dietitian? *J Hum Nutr Diet*. 2003;16:151-158.
3. Miller WR. Motivational interviewing: research, practice and puzzles. *Addict Behav*. 1996;21:835-842.
4. Resnicow K, Jackson A, Wang T, et al. A motivational interviewing intervention to increase fruit and vegetable intake through Black churches: results of the Eat of Life trial. *Am J Public Health*. 2001;91:1686-1693.
5. Rollnick S, Butler CC, McCambridge J, Kinnersley P, Elwyn G, Resnicow K. Consultations about changing behaviour. *BMJ*. 2005;331:961-963.
6. Van Wormer JJ, Boucher JL. Motivational interviewing and diet modification: a review of the evidence. *Diabetes Educ*. 2004;30:404-406, 408-410, 414-406.
7. Dunn C, Deroo L, Rivara FP. The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. *Addiction*. 2001;96:1725-1742.
8. Britt E, Hudson SM, Blampied NM. Motivational interviewing in health settings: a review. *Patient Educ Couns*. 2004;53:147-155.
9. Rollnick S, Miller WR. What is Motivational Interviewing? *Behavioural and Cognitive Psychotherapy*. 1995;23:325-334.
10. Moyers TB, Martin T, Manuel JK, Miller WR. The Motivational Interviewing Treatment Integrity (MITI) Code: Version 2.0. In: University of New Mexico: Center on Alcoholism, Substance Abuse and Addictions (CASAA); 2003.
11. Miller WR, Moyers TB, Ernst D, Amrhein P. Manual for the Motivational Interviewing Skill Code (MISC) Version 2.0. In: University of New Mexico: Center on Alcoholism, Substance Abuse and Addictions; 2003.
12. Van Assema P, Brug J, Ronda G, Steenhuis I. The relative validity of a short Dutch questionnaire as a means to categorize adults and adolescents to total and saturated fat intake. *J Hum Nutr Diet*. 2001;14:377-390.
13. Van Assema P, Brug J, Ronda G, Steenhuis I, Oenema A. A short Dutch questionnaire to measure fruit and vegetable intake: relative validity among adults and adolescents. *Nutr Health*. 2002;16:85-106.
14. Bogers R, Dagnelie PC, Westerterp KR, et al. Using a correction factor to correct for overreporting in a food-frequency questionnaire does not improve biomarker-assessed validity of estimates for fruit and vegetable consumption. *J Nutr*. 2002;133:1213-1219.
15. Oenema A, Brug J, Tan F. Short-term impact of a web-based tailored nutrition intervention; main effects and mediators. *Ann Behav Med*. 2005;29:54-63.
16. Ronda G, van Assema P, Candel M, et al. The Dutch Heart Health community intervention "Hartslag Limburg": results of an effect study at individual level. *Health Promot Int*. 2004;19:21-31.
17. Brug J, Glanz K, van Assema P, Kok G, van Breukelen G. The impact of computer-tailored feedback on fat, fruit and vegetable intake. *Health Educ Behav*. 1998;25:357-371.
18. Lean ME, Han TS, Morrison CE. Waist circumference as a measure for indicating need for weight management. *BMJ*. 1995;311:158-161.
19. Smith DE, Heckemeyer CM, Kratt PP, Mason DA. Motivational interviewing to improve adherence to a behavioral weight-control program for older obese women with NIDDM. A pilot study. *Diabetes Care*. 1997;20:52-54.
20. Rollnick S, Miller WR, Heather N, Longabaugh R, Dunn C. Comments on Dunn et al.'s "The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review." *Addiction*. 2001;96:1769-1775.
21. Miller WR, Yahne CE, Moyers TB, Martinez J, Pirritano M. A randomized trial of methods to help clinicians learn motivational interviewing. *J Consult Clin Psychol*. 2004;72:1050-1062.
22. Snijder MB, Dekker JM, Visser M, et al. Trunk fat and leg fat have independent and opposite associations with fasting and postload glucose levels: the Hoorn study. *Diabetes Care*. 2004;27:372-377.