

A brief motivational intervention to improve dietary adherence in adolescents

S. M. Berg-Smith, V. J. Stevens, K. M. Brown¹, L. Van Horn², N. Gernhofer², E. Peters², R. Greenberg³, L. Snetselaar⁴, L. Ahrens⁴ and K. Smith⁴ for the Dietary Intervention Study in Children (DISC) Research Group

Abstract

Motivational interviewing offers health care professionals a potentially effective strategy for increasing a patient's readiness to change health behaviors. Recently, elements of motivational interviewing and the stages of change model have been simplified and adapted for use with patients in brief clinical encounters. This paper describes in detail a brief motivational intervention model to improve and renew dietary adherence with adolescents in the Dietary Intervention Study in Children (DISC). DISC is a randomized, multi-center clinical trial assessing the efficacy and safety of lowering dietary fat to decrease low-density lipoprotein cholesterol in high-risk children. In the first 3 years of follow-up covering ages 8–13, intervention participants ($n = 334$) were exposed to a family-based group intervention approach to change dietary choices. To address adherence and retention obstacles as participants moved into adolescence (age 13–17), an individual-level motivational intervention was implemented. The DISC motivational intervention integrates several intervention models: stages of change, motivational interviewing, brief negotiation and

behavioral self-management. A preliminary test of the intervention model suggests that it was acceptable to the participants, popular with interventionists and appeared to be an age-appropriate shift from a family-based intervention model.

Introduction

In the 1980s, promising ideas for understanding and enhancing patient motivation to change health behaviors emerged from the addiction field. Specifically, the stages of change model (Prochaska and DiClemente, 1986, 1992) provides a conceptual framework for understanding the process of individual behavior change. This model helped to establish the importance of tailoring intervention strategies to an individual's stage of change, rather than expecting all individuals to be ready for action-oriented strategies. The model, originally constructed from studies of smoking cessation (Prochaska and DiClemente, 1983), has been applied to a broad range of behaviors (Prochaska *et al.*, 1994).

The concept of motivational interviewing, first described by Miller (Miller, 1983) and elaborated by Miller and Rollnick (Miller and Rollnick, 1991), offers a practical therapeutic approach for helping individuals increase their motivation or 'readiness' to change. The motivational interviewing method integrates well within the stages of change model, and has been identified as a promising mechanism for health care providers to adopt in assisting individuals to move through the stages of change towards action and maintenance (Grimley *et al.*, 1995).

Kaiser Permanente Center for Health Research, Portland, OR 97227-1098, ¹Maryland Medical Research Institute, Baltimore, MD 21210, ²Department of Preventive Medicine, Northwestern University Medical School, Chicago, IL 60611, ³Department of Medicine, New Jersey Medical School, Newark, NJ 07107 and ⁴Department of Pediatric Cardiology, University of Iowa, Iowa City, IA 52242-1100, USA

Results of controlled trials support the potential efficacy of motivational interviewing in triggering behavior change among problem drinkers (Miller *et al.*, 1988; Bien *et al.*, 1993; Miller *et al.*, 1993; Senft *et al.*, 1995) and opiate users (Saunders *et al.*, 1995). Current studies apply the motivational interviewing method to a range of populations and health behavior change goals, including diabetes, pain management, compliance with medical advice, eating disorders and HIV risk reduction (Rollnick and Miller, 1995). In addition, key elements of motivational interviewing are being incorporated into other delivery formats including interactive computer programs, self-help materials and group sessions.

Health care professionals, in particular, are increasingly interested in applying motivational interviewing in medical care settings. In recent years, elements of motivational interviewing and the stages of change model have been simplified and adapted for use with patients in brief clinical encounters (Rollnick *et al.*, 1993; Stott *et al.*, 1995; Rollnick, 1996). These brief motivational intervention methods are currently being tested in several controlled trials (Rollnick, 1996), and appear to provide a useful framework of 'concrete strategies' (Rollnick *et al.*, 1992; Rollnick, 1996) for general health care professionals in both hospital and primary care settings.

With the recent development of a widening variety of brief interventions based upon the motivational interviewing model, concerns have been raised about the model being diluted, distorted and/or confused with other approaches (Rollnick and Miller, 1995). To prevent the essential elements of motivational interviewing from being misrepresented, it is imperative to describe brief intervention models in detail. This paper describes in detail a brief motivational intervention to improve and renew dietary adherence with adolescents in the Dietary Intervention Study in Children (DISC). Accompanying the intervention description is an overview of DISC, a rationale for applying brief motivational interventions with adolescents and a summary of results from a preliminary feasibility test. To our knowledge, this is the first application

of a brief motivational intervention to dietary change. Although the setting in which this application was made is unique, the model could be easily adapted to other settings.

Adolescents and brief motivational interventions

Adolescents may be an especially appropriate population for brief motivational interventions conducted in health care settings. First, most adolescent morbidity is related to social and behavior factors, including substance abuse, accidents, sexually transmitted diseases, eating disorders, unwanted pregnancy and depression (Jessor, 1984; Erwin and Millstein, 1986; Blum, 1987; Hofmann, 1990). Health care professionals are in a unique position to prevent such morbidity because of their professional credibility, the 'teachable moments' that occur in the context of health care delivery (Vogt *et al.*, 1989) and their potential to work with a large segment of the adolescent population in a key stage of development. A 1994 Report of the Surgeon General states that adolescents 'perceive these professionals as credible health experts and thus may attend more to what they say than to what parents and other adults say'. Second, as a population group, adolescents are typically in an exploratory or initiation phase with health compromising behaviors (Jaffe, 1988). Researchers suggest that adolescents progress through several stages of behavior initiation and 'habit acquisition which parallel, and exist in succession' with the stages of change model (Werch and DiClemente, 1994). Motivational interviewing and related brief intervention models to change health behaviors are beneficial approaches in the early stages of change (Rollnick and Morgan, 1994; Grimley *et al.* 1995) and may be equally beneficial for adolescents who are considering initiating a behavior, experimenting with a behavior or trying to change a newly established behavior. Third, as adolescents struggle to establish an identity independent from family, parents and other adults, they commonly exhibit resistance to and resentment of authority figures and look to peers for approval and reinforcement (Christopher *et al.*, 1993). The patient-centered

helping style used in motivational intervention models provides opportunities to increase adolescents' sense of control over their lives, which may circumvent usual reactions to adult figures (Tober, 1991). Finally, because adolescents have little patience for attending to things in which they have no interest, brief motivational intervention models are developmentally appropriate, and can be tailored to their unique needs, circumstances and readiness to change. To date, motivational interviewing has been adapted for adolescents (Tober, 1991), but to our knowledge, a brief motivational intervention approach with adolescents has not been evaluated in a controlled trial.

DISC

DISC is a randomized, multi-center controlled trial sponsored by the National Heart, Lung and Blood Institute to assess the efficacy and safety of lowering dietary intake of total fat, saturated fat and cholesterol to decrease elevated serum levels of low-density lipoprotein cholesterol (LDL-C) in children. Children with LDL-C levels in the range of 80–98th percentile for age and sex entered this clinical trial when they were 8–10 years of age and have been followed for 6–9 years. Half the participants receive dietary change counseling and the other half receive usual medical care. The study design and baseline data (DISC Group, 1993), behavioral intervention design and participation (Stevens *et al.*, 1995; Hartmuller *et al.*, 1995), and 3-year results are detailed elsewhere (DISC Group, 1995). The primary goal of the DISC intervention is to reduce LDL-C through adherence to a diet providing 28% of energy from total fat, less than 8% from saturated fat, up to 9% from polyunsaturated fat and less than 75 mg/1000 kcal/day of cholesterol. The diet was designed to meet age- and sex-specific recommended dietary allowance for energy, protein and micronutrients.

Since children 8–10 years of age have little control over their diet, intervention activities in the first few years of DISC focused on the family unit. Intervention sessions included multiple-family group meetings with separate break-out sessions for the children, siblings and adults. At

each contact, families were encouraged to set dietary change goals and to develop action plans to achieve these goals. Throughout the first 3 years of intervention, family-based efforts to change dietary choices were encouraged. When individual counseling sessions were held, entire families were encouraged to participate.

At 3 years, dietary total fat, saturated fat and cholesterol levels decreased significantly in the intervention group compared with the usual care group (DISC group, 1995). In the later years of the trial, intervention adherence has weakened. As the DISC participants moved into adolescence, they have attended fewer group sessions and reduced their involvement in intervention activities. To address adherence and retention obstacles, the DISC study shifted from a group to an individual-level behavior change intervention model in direct response to adolescents' developmental changes.

Description of the intervention model

The DISC motivational intervention model integrates several intervention models: stages of change (Prochaska and DiClemente, 1982, 1986), motivational interviewing (Miller and Rollnick, 1991), brief negotiation (Rollnick *et al.*, 1992) and behavioral self-management (e.g. Watson and Tharp, 1989).

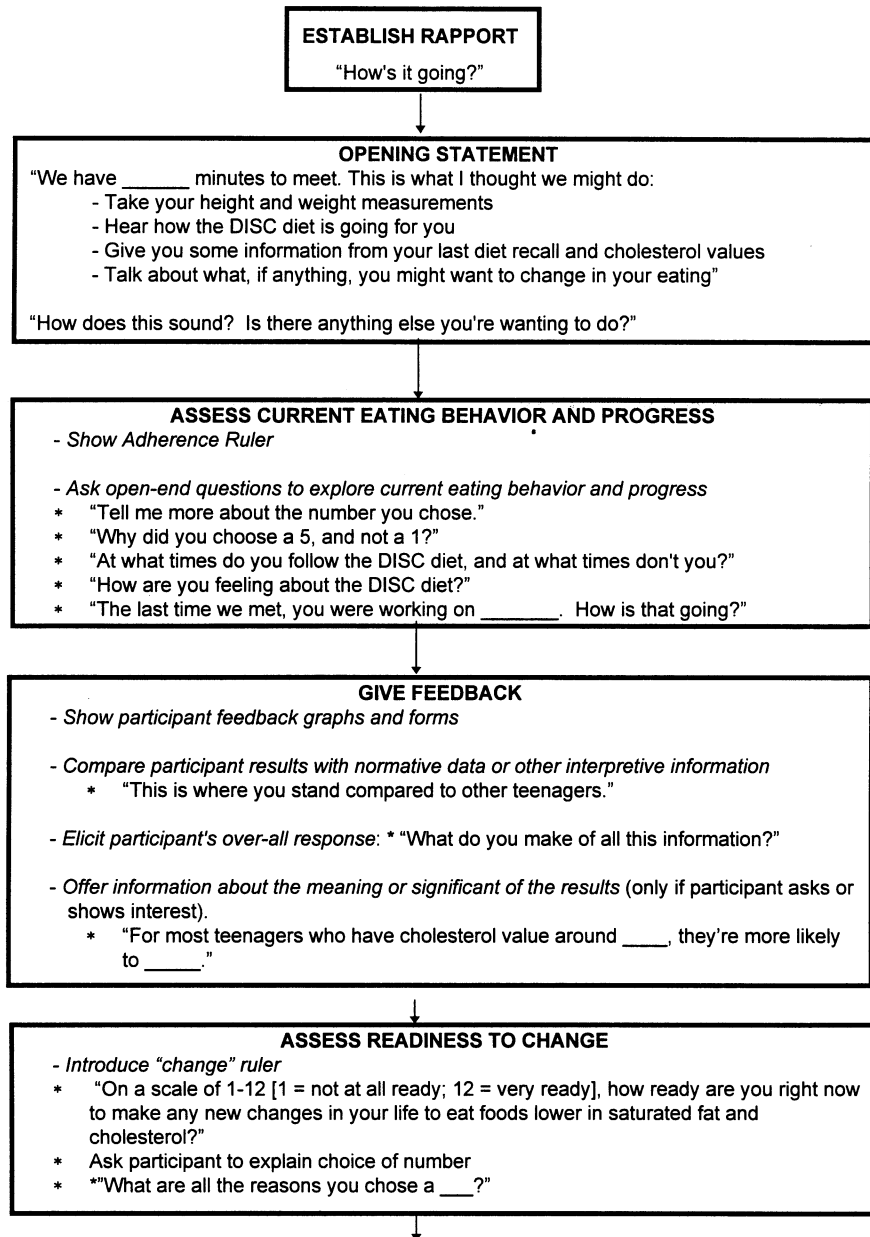
The 'DISC motivational intervention' model was designed to be:

- Applicable to participants who vary in their readiness to change.
- Useable in time-limited encounters ranging from 5 to 30 min.
- Adaptable to both in-person and telephone intervention encounters.
- Developmentally appropriate for adolescents.

The primary purpose of this intervention model was to increase and renew participant motivation or 'readiness' to adhere to the DISC dietary guidelines. Following assessment of readiness to change, the interventionist tailored the intervention strategies to the participant's position on the readiness to change continuum. A major intervention task

was exploring and resolving ambivalence about dietary change and adherence. Goal setting, problem solving and other behavior change strategies were initiated after the participant firmly committed to dietary change and/or adherence.

The intervention model balanced and integrated participant-centered and directive helping approaches. An empathic helping style based on non-judgment, acceptance, open-ended questions and careful listening was used throughout. Inter-



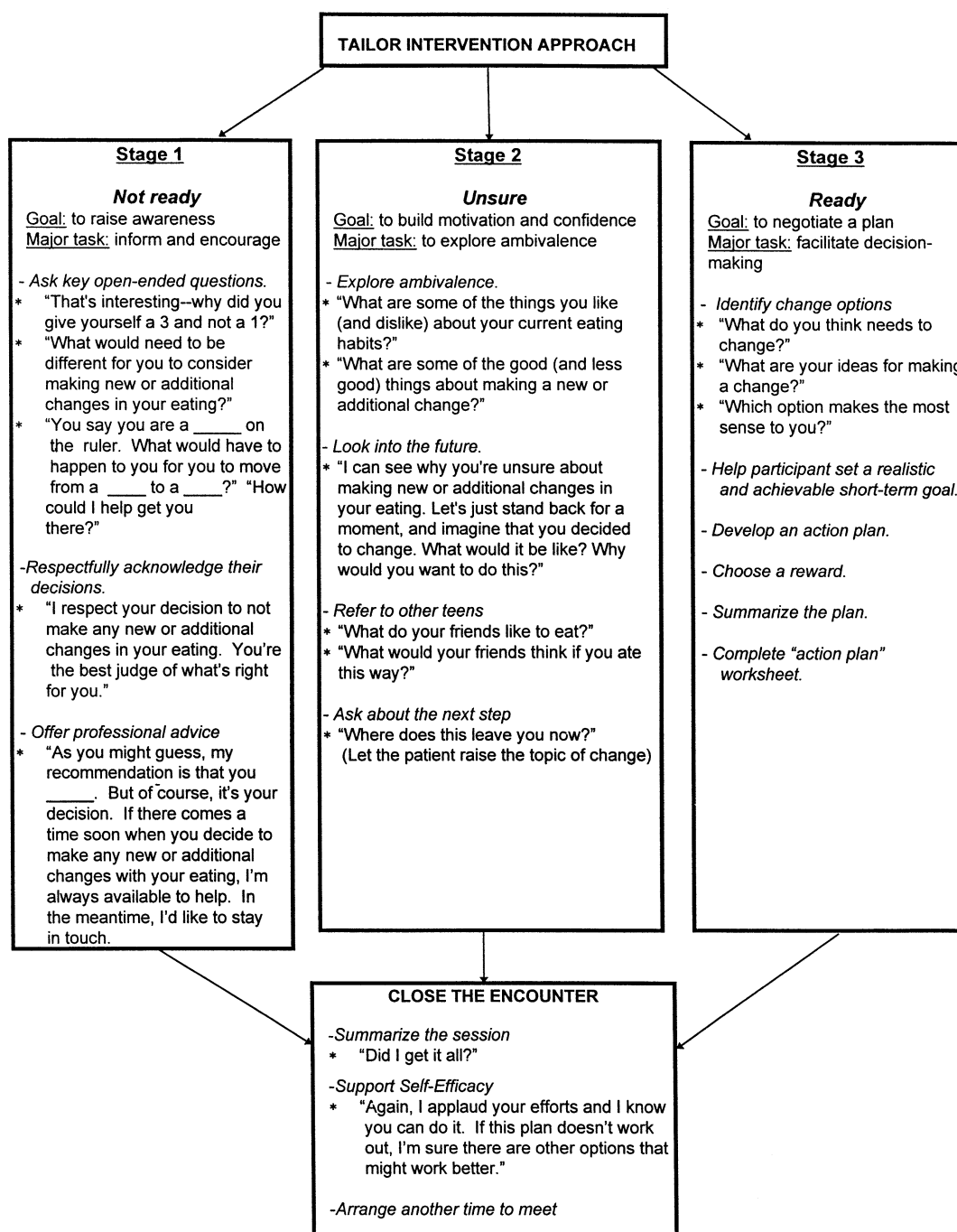


Fig. 1. Motivational intervention components.

ventionists emphasized respect for freedom of choice and encouraged changes based on the participant's decisions. Interventionists structured each encounter by asking a variety of stage-specific open-ended questions to provide opportunities for participants to explore and give voice to concerns, ambivalence, reasons for adherence and ideas for change. When appropriate, the interventionist offered personal feedback, information and advice. At each stage of the intervention, the interventionist sought opportunities to offer words of hope, optimism, affirmation and confidence in the participant's ability to make and sustain change. An ideal intervention encounter occurred when the participant was talking more than the interventionist and actively asked for information and advice.

Intervention components

The seven steps of the DISC intervention model provide a general framework for the interventionist. The steps are sequential, but because a participant's readiness to change may shift during the course of an encounter (Miller and Rollnick, 1991), the order of the steps may be adjusted. In some cases, a step may be omitted and sometimes several steps may be combined. Thus, each intervention encounter is unique. The following text describes the intervention steps in sequence and presents the rationale for the steps. Figure 1 illustrates the model and provides examples.

Establish rapport

The interventionist begins by asking rapport-building, open-ended questions that are relevant and important to the participant's life.

Make an opening statement

The interventionist sets the stage for a safe, non-threatening encounter by suggesting an agenda, giving the participant an opportunity to revise the agenda, emphasizing the participant's freedom of choice and seeking agreement to proceed.

Assess current eating behavior and progress

This step encourages the participant to begin thinking and talking about dietary behavior, provides a valuable opportunity for the interventionist to begin

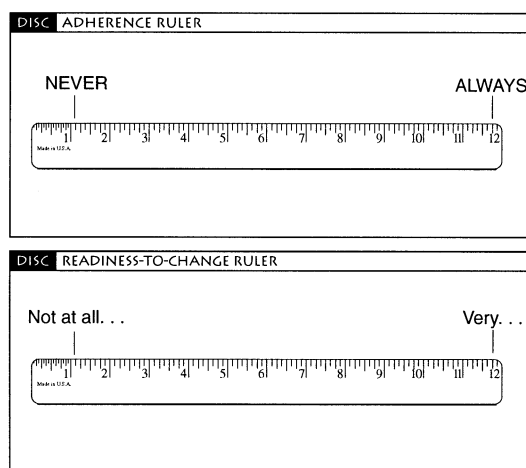


Fig. 2. Assessment rulers.

to understand the participant's assessment and interpretation of progress and adherence, and helps to establish initial 'readiness to change'. The interventionist begins by showing the participant an 'assessment ruler' (see Figure 2) and asks him/her to choose the number that best describes how closely he/she has followed the dietary guidelines (1 = never; 12 = always). Based on the participant's selection, the interventionist asks a series of open-ended questions to encourage the participant to explore in detail his/her current eating patterns, to describe positive behaviors he/she feel good about, and/or to review goals and plans from previous encounters. (See Figure 1, for example.)

Give feedback

The simple act of sharing individualized assessment feedback that is compared with some normative reference can by itself build motivation and strengthen commitment to change (Miller and Rollnick 1991). Evidence for this has emerged in the recent work of Miller and colleagues (Miller *et al.*, 1988; Bien *et al.*, 1993; Brown and Miller, 1993; Agostinelli *et al.*, 1995). In these studies, the professional presents the facts, but leaves interpretation to the patient.

A 'feedback' step in the DISC intervention model involves giving the participant individualized feedback in the form of recent lab results,

height/weight measurements and/or dietary recall data, and comparing his/her results with adolescent 'normative data' or other interpretative information. Feedback is presented in a neutral and objective manner and is immediately followed by asking the participant to offer his/her own interpretation of the information.

If the participant is interested, the interventionist presents information about the meaning and significance of the results by focusing on short-term health consequences that are relevant to teens (feeling lighter, feeling less tired, improved athletic performance) (Flay, 1985; Glynn, 1989), and by referring to 'other teens, and what happens to them', rather than to 'what will happen to you'.

Assessment of readiness to change

The core of the intervention occurs during this step. Readiness to change is explicitly assessed by use of the 'ruler' (Stott *et al.*, 1995) (see Figure 2). The participant is shown a ruler numbered from 1 to 12 and asked to select a number that best describes how ready he/she is to make new or additional dietary changes. Based on the participant's selections, the interventionist tailors the intervention to match the position on the readiness to change continuum.

Tailored intervention approaches

The intervention model at this point branches into three distinct approaches: (1) not ready to change (stage 1), (2) unsure about change (stage 2) and (3) ready to change (stage 3) (see Figure 1). Generally, participants selecting readiness to change numbers from 1 to 4 are identified as being in 'stage 1', from 5 to 8 in 'stage 2' and from 9 to 12 in 'stage 3'. Each approach is guided by asking stage-specific open-ended questions. Since readiness to change is likely to fluctuate during the course of an intervention encounter (Miller and Rollnick, 1991), the interventionist remains flexible, moving back and forth among the three intervention approaches.

Strategies for those not ready to change

The goal for this phase is to encourage the participant in a gentle, respectful manner to think about

change, and to set the stage for future intervention contacts and possible decisions to change.

Asking open-ended questions. Miller and Rollnick (Miller and Rollnick, 1991) emphasize that motivation to change can increase when a person is encouraged to think and talk about change in new ways. Examples of open-ended questions designed to encourage 'change talk' are in Figure 1.

Respecting decisions. When a participant is not ready to change, the interventionist respectfully acknowledges their decision. This strategy is based on the precept that when a person is approached in a non-judgmental, accepting manner, the person may feel more open to considering change rather than needing to defend resistance to change (Miller, 1995).

Offering professional advice. Advice-giving has been identified as one of several common elements of effective brief interventions (Miller and Sanchez, 1994). In the DISC intervention model, advice is offered in a clear, succinct, supportive, non-judgmental manner. Choice and personal responsibility are emphasized. Ideally, the participant asks for advice; otherwise, the interventionist requests permission to offer it. Offering advice is followed by an open-ended question to elicit the participant's response.

Strategies for those unsure about change

The goal for this stage is to encourage the participant to explore and resolve ambivalence about adherence to the DISC dietary guidelines. Miller and Rollnick (Miller and Rollnick, 1991) identify this task as the most important in building motivation and confidence to change.

Exploring ambivalence. This strategy involves asking the participant about the pros and cons of current dietary behavior or the pros and cons of making dietary change (Rollnick *et al.*, 1992). Questions about the 'good things' in current eating behavior or the advantages for not making change are asked first, as they are less threatening, facilitate dialogue and often set the stage for the participant to discuss the 'less good things' or disadvantages.

The interventionist's primary responsibility during exploration of the pros and cons is to

listen carefully, summarize the two sides of the participant's ambivalence and to end by asking about the next step. Ideally, the question of dietary change, if the participant is ready, will naturally arise out of the 'next step' question.

Strategies for those ready to change

The goal for this stage is to strengthen commitment to change by eliciting from the participant viable options, goals and strategies for change.

Brainstorming and identifying change options.

The interventionist's role is to encourage exploration by asking a series of open-ended questions to encourage identification of ideas and options for dietary change; the counselor also uses his/her expertise to present options that have 'worked for other teenagers'. The interventionist stays neutral during this process and emphasizes these themes:

There is usually not one but many courses of action.

You will be the best judge of what will work for you.

Let's go through some of the options together.

Once the participant selects an option, the interventionist facilitates a process of helping the participant set a realistic and achievable short-term goal(s), develop a detailed action plan and choose a reward.

Option-setting tools. When a participant has a difficult time generating ideas and options for change, the 'options tool' (see Figure 3) is used. This strategy has been adapted from a similar strategy outlined by Stott *et al.* (Stott *et al.*, 1995); it is unique in that it simultaneously allows the interventionist to present ideas for change and helps the participant to identify a change option that will work for him/her. The 'options tool' illustrates a range of dietary change 'focus areas' (e.g. eating out, school lunches, snacks) that may help a participant lower his/her saturated fat and cholesterol. The tool also includes several blank spaces to represent 'focus areas' that the participant might identify. The 'options tool' is introduced as such: 'In the circles are some things that other

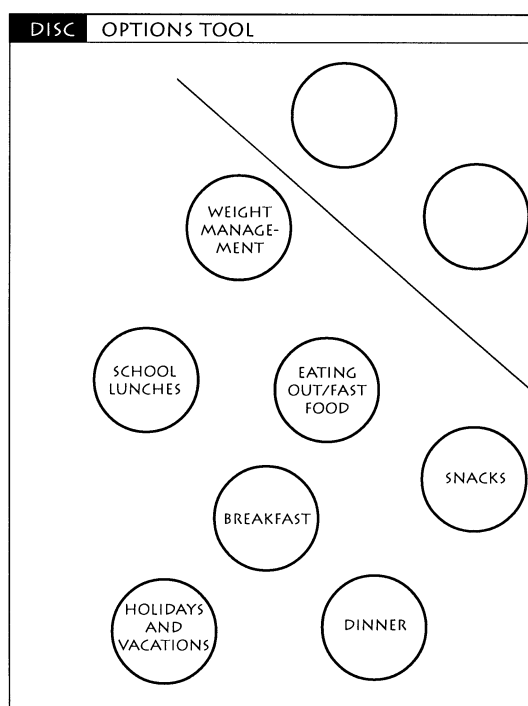


Fig. 3. Options tool.

DISC participants have found useful to focus on for health eating. These blank spaces are for any other things that you think are important. What do you think? Which option makes the most sense to you?'

Closing the encounter

The intervention visit concludes with the interventionist summarizing the session. Important in the closing are words of hope and confidence, and an acknowledgment and appreciation of the participant's willingness to engage in a discussion about dietary change. Follow-up visits are scheduled at this time. Within a week of the visit, a short letter is sent to the participant's home thanking him/her for the visit and restating what transpired (e.g. plan of action).

Follow-up sessions

Follow-up sessions were conducted 1–3 months after the initial meeting. Depending upon the participant's preference these sessions were con-

ducted either in person or by telephone. Follow-up interventions followed the described intervention model, with minor variations. For example, a specific focus in a follow-up intervention might involve reviewing progress from the previous encounter.

Training of interventionists

The DISC interventionists were primarily master's degree level health educators and nutritionists. Interventionists completed 18 h of training in motivational interviewing and related brief intervention strategies. The training involved a mixture of didactic education, demonstrations and practice. Interventionists were presented with models for understanding motivation and adolescent development, guided through a structured and sequenced series of exercises to build reflective listening and other patient-centered counseling skills and taught a set of specific strategies for increasing motivation or 'readiness' to change. The majority of the training was devoted to observing and discussing video-taped demonstrations and role-playing practice of the DISC intervention model. The training was facilitated by leaders who had completed Miller and Rollnick's motivational interviewing and brief intervention 'training for trainers' program. Following the training, interventionists met monthly for case conferencing, structured role-play practice and review of intervention strategies.

Methods

Evaluation of the short-term effects of the DISC motivational intervention of dietary change and participant acceptability was conducted using a pre-to-post intervention design among a subset of the total intervention cohort ($n = 334$). This subset included the first 127 participants who appeared for regularly scheduled intervention visits after implementation of the new intervention method. These participants ranged in age from 13 to 17 with an equal proportion of boys to girls. The 127 participants exposed to the initial motivational intervention were asked to return in 4–8 weeks for a follow-up session. Initial sessions were conducted

in person, follow-up sessions were conducted either in person or by telephone.

Outcome measures

Dietary intake

Three 24-h dietary recalls were collected within 2 weeks after the follow-up session. These dietary data were compared to three baseline 24-h dietary recalls collected in the year preceding initial exposure to the motivational intervention method. The 24-h dietary recalls were collected by trained and certified DISC nutritionists, and analyzed by use of the Nutrition Data System (NDS version 2.8). Average 3-day nutrient values were obtained from the three recalls. Specific nutrient values included total fat (%kcal), saturated fat (%kcal) and dietary cholesterol (mg/1000 kcal).

Self-reported dietary adherence/readiness to change

At initial and follow-up intervention sessions, participants were shown 'assessment rulers' (see Figure 2) numbered 1–12, and asked to rate their adherence to dietary guidelines and their readiness to make new or additional dietary changes.

Action plan outcome

- Initial session: at the end of the initial intervention sessions, interventionists reported whether or not participants had completed a detailed action plan.
- Follow-up session: at the end of follow-up intervention sessions, interventionists reported whether or not participants had successfully implemented action plans from baseline sessions.

Results

A total of 127 intervention participants attended an initial in-person motivational intervention session. All 127 agreed to either an in-person or telephone follow-up counseling session. Baseline and post-intervention data were collected an average of 3.3 months apart. The mean proportion of calories from fat decreased from 27.7 to 25.6% ($P < 0.001$)

and the proportion of calories from fat decreased from 9.5 to 8.6% of total energy intake ($P < 0.001$). In addition, consumption of dietary cholesterol decreased from 182.8 to 157.3 mg/1000 kcal ($P < 0.003$). A comparison of males and females showed similar results in both groups. The self-reported adherence rating score and readiness to change score increased by approximately 1 point on a scale from 1 to 12 (both $P < 0.001$); action plans were made by 94% of the participants and successfully implemented by 89%. At the end of each follow-up session, counselors evaluated their 'satisfaction' in using the motivational intervention method: 39% of the intervention sessions were reported at being 'very satisfying', 35% as 'satisfying', 19% as 'somewhat satisfying' and 7% as 'slightly' or 'not satisfying.'

Discussion

The short-term results from this preliminary test of a brief motivational intervention as applied to nutritional counseling for adolescents are encouraging. Without a control group, however, we are not able to predict if significant reductions in consumption of dietary and cholesterol are attributable to the intervention. We can report that the DISC motivational intervention was acceptable to the participants, viewed as effective by interventionists and appeared to be an age-appropriate shift from a family-based group intervention model. Interventionists reported that teens liked being treated as adults, and they seemed particularly responsive to the opportunity to express their own choices about what and how much to eat. Interventionists were enthusiastic about having a new repertoire of strategies for working with participants who are not ready for or ambivalent about dietary change. Overall, the intervention successfully re-engaged participants in personalized goal setting, and appeared to increase and renew adherence to the DISC dietary guidelines.

In implementing this brief motivational intervention, we found the training of interventionists to pose a noteworthy challenge. The skills and

strategies of motivational interviewing often run counter to the 'action-oriented' intervention approach (i.e. goal setting, skill building, problem solving) that health educators and dieticians are trained and accustomed to. The skills of reflective listening and open-ended questions, in particular, require considerable practice and coaching, and, ultimately, are difficult for some to learn. Overall, we found the initial 18 h of training essential for establishing a foundation in the model, but not sufficient for interventionists to absorb and integrate key skills and strategies. As a result, we provided additional ongoing support in the form of supervised role-play practice and case consultation.

While early indications suggest that school and peer group approaches to changing health behaviors in adolescents may be more promising than individual-level interventions in the health care setting (Hollis *et al.*, 1994), the paucity of studies investigating individual-level intervention models makes it difficult to reach definitive conclusions. It is clear that basic research in this area and the development of individual-level intervention models responsive to an adolescent population are needed. Based upon our positive experience in applying this brief motivational intervention model to dietary change with adolescents, we would encourage further development and testing of this and related approaches to other target behaviors. Although the setting in which this application was made is unique, we submit that this model will find many interesting applications in a variety of settings.

Acknowledgements

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