National and international focus on evidence-based health care delivery has led the American Dietetics Association (ADA) to engage in two key initiatives to promote a shift among dietetic professionals from practice-based (or experience-based) to evidence based decision making. The first major initiative was the launch of the ADA Evidence Analysis Library (EAL) engaging forward thinkers in our profession in the work of delineating and delivering to the membership available scientific evidence to support our practice.

The second key initiative launched by ADA was the development of the Nutrition Care Process (NCP); guiding practitioners to utilize a standardized critical thinking process to address nutrition care problems. This new process endorses clear identification of nutrition-related problems, using a problem, etiology, signs and symptoms (PES) format to identify the occurrence, risk and potential for nutrition problems. Evidence-based interventions are applied and relevant monitoring and evaluation goals are established. Evidence-based nutrition counseling interventions are described in terms of the core theoretical framework used and strategies applied to achieve these specific goals. This new critical thinking method causes us to be more deliberate in our selection of counseling strategies and more aware of the theoretical-basis for our decision-making. Documentation of these critical decision points by dietitians across our profession will in the long-term be invaluable for building the knowledge base of our profession.

Nutrition counseling is one of our profession’s signature intervention methods. To be recognized as “the nutrition counseling expert”, it is crucial that our profession carefully track and report nutrition counseling outcomes to better understand what theoretical frameworks are most relevant to the diet change process and what strategies are most effective when addressing specific nutrition-related barriers. The NCP sets the stage for our future success.

**EAL Nutrition Counseling Work Group**

The Nutrition Counseling EAL Project is relevant to many dietetics professionals who routinely counsel clients using behavior change strategies to improve food and nutrition-related behaviors. You may recognize many of the EAL Nutrition Counseling Work Group (NCWG) members who have been enlisted by ADA to execute this important project. They include: Becky Reeves, PhD, RD, FADA, Chair; Ida Laquatra, PhD, RD, LDN; Molly Kellogg, RD, LCSW; Kathy Kiem, PhD, RD, LDN; Bonnie Jortberg, MS, RD, CDE; Nicole Clark, MS, RD, LDN; and Catherine Hagood, MS, RD, CDE, LD/N. I had the great honor to assist these highly knowledgeable and experienced members as the Project Manager and Lead Analyst, working with a host of talented analysts.

In accordance with the ADA EAL process, the birth of the NCWG resulted from an investigation of what ADA members value. Recognizing that behavior change theories and strategies are the evidence-base that guides effective nutrition counseling interventions, the working group focused their attention on evaluating evidence related to the application of behavior change theories and strategies in nutrition counseling. They reviewed the literature related to the following frequently used behavior change theories:

- Cognitive Behavioral Theory
- Social Learning Theory
- Transtheoretical Model (Stages of Change)

The work group also evaluated the literature related to the following behavior change strategies:

- Motivational interviewing
- Self-monitoring
- Meal replacements and structured meal plans
- Reward and reinforcement
- Problem-solving
- Social support
- Goal setting
- Cognitive restructuring

The goal was to determine whether behavior change theories, when used as a framework...
for nutrition intervention, facilitated health and food behavior change. If sufficient evidence was available, analysis was conducted by treatment target (e.g., diabetes prevention or management, cardiovascular disease risk reduction or weight management) and duration of treatment including: short (<6 months), intermediate (6–12 months) and long (>12 months) duration. Questions were asked about the optimal dose (defined as intensity) of nutrition counseling and whether group or individual counseling was more effective. This article will concentrate on findings related to behavior change theories, dose and individual and group counseling. A subsequent article will outline findings related to nutrition counseling strategies.

The workgroup established inclusion and exclusion criteria for studies to be included as part of the project. These criteria included:

- Adult subjects (>18 years of age)
- Counseled in an outpatient or clinic setting
- Subjects with a diagnosis of eating disorder were excluded
- Studies published between 1986–2007
- Dropout rate <30%
- Sample size ≥10 adults per study group
- English language
- Peer-reviewed journal
- Randomized controlled trial, nonrandomized trials, cohort, case-control studies and meta-analysis included

In accordance with ADA's evidence analysis process, a systematic search of the literature was conducted and the working group reviewed the evidence carefully, taking into account the study’s relevance and scientific validity. The work group summarized and graded the evidence using the following ADA EAL grading scale: Grade I is associated with good evidence in support of the statement; Grade II suggests fair evidence exists; Grade III represents weak evidence; Grade IV equates evidence to expert opinion caliber; and Grade V means not assignable, typically due to lack of evidence. Table 1 summarizes the grade of evidence assigned for each theory and treatment duration, reported by target population. For example, fair evidence exists to support the effectiveness of short duration cognitive behavioral therapy of less than 6-month duration targeted to diabetes management and long-term weight loss maintenance. Available evidence is good for efficacy of intermediate duration CBT targeted to diabetes management.

**Cognitive Behavioral Therapy**
Cognitive Behavioral Therapy (CBT) is an important framework for nutritional counseling. It involves teaching clients to use both cognitive and behavioral strategies to change problem behaviors. CBT is based upon the assumption that all behavior is learned and is directly related to internal factors (e.g., thoughts and thinking patterns) and external factors (e.g., environmental stimulus and reinforcement) that lead to undesirable eating habits (1). CBT is sometimes called behavior therapy, behavior modification or lifestyle change therapy and is frequently utilized with clients motivated to make behavior changes since it does not address attitudes or intention to change. Dietitians using CBT frequently encourage clients to self-monitor, set behavior change goals, use stimulus control and cognitive restructuring strategies, and problem-solving techniques. CBT is frequently implemented in a group setting, but can be applied in individual counseling. The workgroup found that the evidence for the effectiveness of CBT was very strong for modifying targeted dietary habits and weight as well as cardiovascular and diabetes risk factors.

**Cardiovascular Disease Risk Reduction**
Four, large, well designed randomized controlled studies (greater than 18-months in duration) affirm the benefit of CBT in reducing cardiac risk factors. The Trials of Hypertension Prevention II study and the PREMIER Trial both found CBT applied to middle-aged men and women with pre-hypertension or stage 1 hypertension to be effective in facilitating modification of dietary habits, weight and risk for hypertension, as compared to an advice-only group (3,4). Two large, positive quality studies, the Women's Health Initiative Dietary Modification Trial (N=48,835) and the Women’s Healthy Lifestyle Project Clinical Trial assessed the effect of long-term CBT on perimenopausal or post-menopausal

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### Table 1. Grade of the evidence related to behavior change theories applied in nutrition counseling interventions of varying duration, and targeted to diabetes prevention, diabetes management, cardiovascular disease CVD risk reduction, weight reduction and long-term maintenance of weight loss.

<table>
<thead>
<tr>
<th>Theoretical framework and treatment duration</th>
<th>Grade I (Good evidence)</th>
<th>Grade II (Fair evidence)</th>
<th>Grade III (Weak evidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBT* Short (&lt;6 months)</td>
<td>Diabetes management (2)**</td>
<td>Diabetes Management (2)**</td>
<td>CVD risk reduction (2)</td>
</tr>
<tr>
<td></td>
<td>Long-term weight loss maintenance (8)</td>
<td>Long-term weight loss maintenance (8)</td>
<td>Weight reduction (2)</td>
</tr>
<tr>
<td>CBT Intermediate (6–12 months)</td>
<td>Diabetes management (6)</td>
<td></td>
<td>CVD risk reduction (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weight reduction (1)</td>
</tr>
<tr>
<td>CBT Long (&gt;12 months)</td>
<td>Diabetes prevention (10)</td>
<td></td>
<td>Weight reduction (3)</td>
</tr>
<tr>
<td></td>
<td>CVD risk factor reduction (4)</td>
<td></td>
<td>Diabetes Management (4)</td>
</tr>
<tr>
<td>Transtheoretical Model</td>
<td></td>
<td></td>
<td>Diabetes management (1)</td>
</tr>
<tr>
<td>Social Learning Theory</td>
<td></td>
<td></td>
<td>CVD risk reduction (1)</td>
</tr>
<tr>
<td>Diabetes management (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*CBT Cognitive Behavioral Therapy
**Indicates the number of articles evaluated

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women and found significant benefit as compared with a control group (5,6).

Intermediate and short interventions were also effective in facilitating weight loss, and producing beneficial change in diet and exercise habits, triglyceride and serum cholesterol levels, and blood pressure. Additional studies with more intense, validated behavioral components were recommended to assess optimal outcomes that are achievable. McCoin et al, (2008) in her excellent review of medical nutrition therapy delivered by RDs for disorders of lipid metabolism, noted the need for research in identifying effective theoretical frameworks to use with this disorder (7). Implementation of the ADA Nutrition Care Process, which calls for the routine documentation of theoretical framework used in nutrition counseling, may facilitate more dietitian led studies for use in this type of analysis (2).

**Diabetes Prevention and Management**

CBT has facilitated very impressive reductions in diabetes incidence. Both the Diabetes Prevention Program Research Team and the Finnish Diabetes Prevention Study Team found a 58% reduction in the incidence of type 2 diabetes. Descriptions of these interventions are available on the EAL (www.adaevidencelibrary.com).

Evidence on the effectiveness of CBT in diabetes management was also strong, particularly for high intensity treatments of intermediate duration. After one year, the large, multi-clinic Look Ahead Study showed highly significant improvements in HDL, reduced use of glucose and lipid lowering and hypertension medications, reduced triglycerides, increased fitness levels, decreased prevalence of urine albumin-to-creatinine ratios >30µg per mg, and a decrease in the number of patients meeting criteria for metabolic syndrome, as compared to the control group (10). Intensive therapy included three weekly meetings and one individual session monthly for the first six months and classes every other week from July to December. The control group received usual care which included diabetes support and education.

Kim et al, (2006) achieved significant improvements in HgA1C, fasting blood glucose, weight, systolic blood pressure, and carotid mean media thickness (IMT) progression in 12 months in Korean subjects. After a 16-week CBT program (150 min/week), the mean HgA1C of 8.5 ± 1.4% was reduced to 7.6 ± 0.9% at 6 months post-treatment (11). Mayer-Davis et al, (2004) assessed the effect of intensive CBT as compared to reimbursable care and usual care and found intensive care produced significantly more weight loss. Intensive therapy included weekly meetings with the study nutritionist for delivery of the first 4 months of the core curriculum (intensive), every other week for the next 2 months (transition), and once a month for the remaining 6 months (maintenance). Reimbursable care consisted of four, one-hour sessions over the course of 12-months (1 individual, 3 group sessions). Usual care included 1 individual session by a study nutritionist at the beginning of the 12-month period (12).

Conclusion statements for each question are available on the EAL Web site. Dietitians can scroll down to see the evidence summary and a table that describes each intervention in some detail. Worksheets are also available that provide a concise review of each research paper included in the analysis.

**Weight Management**

Six small studies were identified to assess the effectiveness of CBT targeted to weight reduction. Eight studies were identified that assessed long-term maintenance of weight loss after short duration CBT interventions. Numerous CBT studies designed to facilitate weight loss were also targeted to patients with diabetes and/or cardiovascular disease. Few dietitian-led interventions specifying a theoretical framework have been published. CBT was consistently found to be an effective method to facilitate weight loss, maintenance of weight loss and prevention of weight gain.

**Transtheoretical Model**

The Transtheoretical Model views the behavior change process as a sequence of cognitive (attitudes and intentions) and behavioral stages of change. These stages are precontemplation, contemplation, preparation, action and maintenance. The model endorses specific evidence-based strategies for each stage designed to move clients along the continuum of change (13). This theoretical framework offers dietitians strategies to enhance a person's attitude and motivation toward diet change. Much work has been done on this model, particularly on development of assessment tools to measure an individual's stage of change. Numerous computer-based interventions have incorporated this theoretical framework, to tailor low-intensity interventions to enhance people's diet readiness to change.

Only one article was found that assessed the application of the Transtheoretical Model in face-to-face nutrition counseling. In this well designed study, 1,029 individuals with type 1 or type 2 diabetes, who were in one of three pre-action stages of change, received an intervention from the Transtheoretical Model of change (14). The following significant results were reported: an improved stage of change (movement to the action or maintenance stage), a decrease of calories from fat, higher daily vegetable and fruit intake, and decreased HgA1C (those in the action stage). This study strongly supported application of the Transtheoretical Model in improving health and food behavior change. Additional research is needed to assess the effectiveness of this model to nutrition counseling across the scope of practice.

**Social Cognitive Theory**

Social Cognitive Theory (SCT), sometimes called Social Learning Theory, provides a framework for understanding how people acquire and maintain certain behaviors. The theory identifies a dynamic, reciprocal relationship between the environment, the person, and behavior, leveraging changes in one area that impact other areas. For example, a change in environment (e.g., mother accepts a full-time job) produces a change in the individual (less time to plan/prepare healthy meals) and consequently a change in behavior (starts to rely on high-fat fast food for dinner). Interventions using the Social Cognitive Theory target behavior, rather than knowledge and attitudes, and emphasize the importance of observational learning, enhancement of self-efficacy, and skill development training (15). For example, principles of SCT may be used to design a course that uses peer counseling [Continued on page 10]
Optimal Dose of Nutrition Counseling

The NCWG attempted to answer the following question: “What is the evidence that the dose (defined as intensity) of the nutrition counseling intervention will result in a change in knowledge, skills, behavior, or chronic disease risk factors in adult outpatients?” There were no studies found which evaluated dose of nutrition counseling as an independent variable in nutrition intervention studies. Dose of treatment was considered as part of the Diabetes and the Disorders of Lipid Metabolism EAL projects and results are available on the ADA EAL Web site.

Individual versus Group Counseling

The NCWG evaluated evidence related to the effectiveness of individual versus group nutrition counseling. Three positive-rated randomized controlled trials were identified that evaluated individual versus group counseling targeted to weight or diabetes management in middle-aged subjects. These short-duration studies found group counseling significantly more effective than individual counseling, but the dropout rate in two of the three studies exceeded 30%, so validation of these findings is clearly needed.

Summary

The ADA EAL promotes the use of evidence-based practice by nutrition professionals. The Nutrition Counseling EAL Project summarizes the evidence on the most frequently used theoretical frameworks in nutrition counseling interventions. There was good evidence to support the application of CBT in nutrition counseling. Additional research is needed to understand the effect on nutrition-related outcomes of the Transtheoretical Model and Social Cognitive Theory in nutrition counseling.

Dietitians are encouraged to routinely document the theoretical basis for nutrition counseling intervention decisions. In the long-term, this will build the dietetic profession’s knowledge base regarding efficacy of various theoretical frameworks used to address specific nutrition diagnoses and barriers to change.

REFERENCES


Joanne M. Spahn, MS, RD, FADA, has her own nutrition consulting business. She has served as a Project Manager or Lead Analyst on six ADA Evidence Analysis Library Projects. She has worked extensively on the ADA Nutrition Care Process and Standardized Language Project since 2006, including the first and second editions of the International Dietetics and Nutrition Terminology (IDNT) Reference Manual: Standardized Language for the Nutrition Care Process.

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