

# Behavioral Programs for Type 2 Diabetes Mellitus: Current State of the Evidence

## Focus of This Summary

This is a summary of a systematic review evaluating the evidence about factors that contribute to the effectiveness of behavioral programs for type 2 diabetes mellitus (T2DM). The systematic review included 132 studies of T2DM published between January 1, 1993, and January 2015. The full report, listing all studies, is available at [www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs](http://www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs). This summary is provided to assist in informed clinical decisionmaking. However, reviews of evidence should not be construed to represent clinical recommendations or guidelines.

## Background

In 2012, 29.1 million Americans had diabetes mellitus, representing 9.3 percent of the entire U.S. population, 12.3 percent of adults aged 20 years or older, and 25.9 percent of adults aged 65 years or older. In the United States, T2DM accounts for 90 to 95 percent of diabetes cases, while type 1 diabetes mellitus (T1DM) accounts for 5 to 10 percent.

Management of T1DM and T2DM involves clinical care and enabling patients to adopt self-management behaviors. Because knowledge acquisition alone is insufficient for patients to achieve behavioral changes, the focus of many national and international guidelines for self-management education has shifted from traditional didactic educational services to more patient-centered methodologies that incorporate interaction and problem-solving.

Behavioral programs for diabetes may be defined as organized, multicomponent programs that consist of repeated interactions with one or more trained individuals for a duration of  $\geq 4$  weeks to improve disease control, patient health outcomes, or both. These programs consist of at least one of the following:

- a) diabetes self-management education (DSME), which provides education on diabetes-related topics (including the disease process, treatment options, nutritional management, physical activity, safe medication use, glucose monitoring [when necessary], prevention and detection of acute and chronic diabetic complications) and addresses psychosocial issues related to living with diabetes;
- b) a structured dietary intervention (related to weight loss, glycemic control, or reducing the risk for diabetic complications) together with one or more additional components; or
- c) a structured exercise or physical activity intervention together with one or more additional components.

Additional components for (b) and (c) above may include interventions related to: diet or physical activity; behavior change (including goal setting, problem-solving, motivational interviewing, coping skills training, and cognitive behavioral therapy strategies); relaxation or stress reduction; blood glucose regulation; medication adherence; or self-monitoring for diabetic complications (foot exam, eye exam, and renal tests).

The national standards for DSME developed by the American Association of Diabetes Educators and the American Diabetes Association have incorporated the provision of ongoing diabetes self-management support “to encourage behavior change, [to foster] the maintenance of healthy diabetes-related behaviors, and to address psychological concerns.”

Previous studies have shown that, in patients with T2DM, behavioral programs that focus on self-management and lifestyle interventions significantly improve short-term glycemic control. This systematic review sought to determine which program factors optimize the effectiveness of behavioral programs in patients with T2DM in the community health setting.

## Conclusions

- Most lifestyle and DSME-plus-support programs offering  $\geq 11$  contact hours led to clinically important improvements in glycemic control.
- In-person delivery of behavioral programs appeared to be more beneficial than communicating the information via an online or telephone component.
- Lifestyle programs appeared better for reducing body mass index (BMI) than DSME programs.
- Behavioral programs seemed to benefit patients with suboptimal or poor glycemic control more than those with good control.
- Tailoring programs to ethnic minorities appeared beneficial.

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## Overview of Clinical Research Evidence

### Correlates of the Effectiveness of Behavioral Programs for Managing T2DM

- Previous studies have shown that self-management and lifestyle interventions significantly improve short-term glycemic control.
- Most lifestyle and DSME-plus-support programs offering  $\geq 11$  hours of contact with delivery personnel led to clinically important improvements in glycemic control. Benefit for glycemic control from DSME programs offering  $\leq 10$  hours of contact was limited.
  - In-person delivery of programs appeared to be more beneficial than delivery accomplished via use of technology.
  - Behavioral programs seemed to benefit participants who have suboptimal or poor glycemic control more than those with good control.
  - Tailoring programs to ethnic minorities (e.g., including peers in the delivery or social support groups) appeared to be beneficial.
  - Programs that focused on lifestyle or on DSME were shown to have similar benefit in terms of glycemic control.
- For BMI, lifestyle programs (usually combining a structured diet, exercise, and evidence-based behavioral strategies) provided the most benefit.
- Behavioral programs were more beneficial than didactic educational interventions for improving glycemic control.
- In subgroup analyses, results for reduced hemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) favored participants with suboptimal baseline glycemic control ( $\geq 7\%$  HbA<sub>1c</sub>), adults  $< 65$  years of age, and minority participants. However, the findings for age and minority status were confounded by poorer baseline glycemic control among these participants.

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## What To Discuss With Your Patients and Their Caregivers

Clinicians might consider encouraging appropriate patients to engage in behavioral support programs to improve the risk factors of diabetes mellitus. Points to be discussed with patients and their caregivers include:

- That some types of behavioral programs for diabetes may be effective, particularly for improving glycemic control, and what evidence there is for their effectiveness
- Which behavioral programs for diabetes or which components fit with the patient's needs and preferences
- Which programs are covered by the patient's insurance
- The importance of adherence to the behavioral programs and the need for following up with their clinician after program completion to assess progress

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## Gaps in Knowledge and Limitations of the Evidence Base

- The identification of the combination of providers (e.g., physicians, nurses, dietitians, pharmacists, social workers, psychologists, trained lay individuals) that is best for implementing behavioral programs for patients with T2DM deserves further evaluation.
- Trials including populations with diverse ethnic backgrounds should perform subgroup analyses based on age, ethnicity, and baseline glycemic control.
- Few trials directly compared interactive programs delivered in person with those delivered via technology.
- The use of behavior change techniques within the programs assessed in this review was highly variable.
- Evaluation of outcomes important to patients and decisionmakers (e.g., quality of life, vascular complications, health care utilization) was inconsistent across studies.
- Consensus is needed on what constitutes clinically important differences in outcomes for behavioral programs.

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## Companion Resource for Patients



*Behavioral Programs To Help Manage Type 2 Diabetes: A Review of the Research for Adults* is a free companion to this clinician research summary. It can help patients with diabetes and their caregivers talk with their health care professionals about the various behavioral programs that might help manage diabetes.

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## Ordering Information

For electronic copies of this clinician research summary, the companion patient resource, and the full systematic review, visit [www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs](http://www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs). To order free print copies of the patient resource, call the AHRQ Publications Clearinghouse at 800-358-9295.

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## Source

The information in this summary is based on *Behavioral Programs for Diabetes Mellitus*, Evidence Report/Technology Assessment No. 221, prepared by the University of Alberta Evidence-based Practice Center under Contract No. 290-2012-00013-I for the Agency for Healthcare Research and Quality, September 2015. Available at [www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs](http://www.effectivehealthcare.ahrq.gov/diabetes-behavioral-programs). This summary was prepared by the John M. Eisenberg Center for Clinical Decisions and Communications Science at Baylor College of Medicine, Houston, TX.

