Improving Patient Problem Solving to Reduce Barriers to Diabetes Self-Management

Shelagh A. Mulvaney, PhD

Only 36% of adults with type 2 diabetes meet the American Diabetes Association recommended target of 7% for A1C. Adherence to intensive treatment has been shown to improve diabetes outcomes and may reduce disparities in outcomes that exist between white and ethnic minority patients. Reasons for inadequate adherence include the nature of the self-management tasks, the nature of the skills and supports needed to adaptively identify and resolve barriers to adherence, and the need for ongoing motivation. Barriers to self-management occur in a variety of situations and contexts, and support needs to adaptively fit each patient’s unique barriers and lifestyle. Although there are issues regarding implementing problem solving within the clinical setting, support for and reinforcement of self-management problem solving should be provided both within and outside of the clinic.

Problem Solving Is a Core Diabetes Self-Management Skill

Low self-care adherence typically indicates an interaction between barriers to self-management and inadequate application of coping and problem-solving skills. Problem solving may be thought of as one form of primary control, engaged (or approach-focused) coping. Utilization of an active problem-focused style of approaching barriers to self-management has been related to lower A1C values, whereas a disengaged or avoidant style has been related to higher A1C.

Problem solving is recommended as a core facet of diabetes self-management education for adults, younger patients, and caregivers or family members. A substantial set of studies and reviews have supported relationships between patient and family problem-solving behaviors and improved self-management, A1C, and other outcomes, such as emergency visits and hypoglycemic events. Successful problem-solving interventions exist for both type 1 and type 2 diabetes and cut across a variety of age, ethnic, and socioeconomic groups. Problem solving has been the primary focus of effective interventions, but it is frequently incorporated into approaches that include basic diabetes literacy or other related skills.

Feedback.

Self-management interventions typically provide patients with their performance levels or feedback on clinical indicators, behaviors, or problem-solving progress. The provision of feedback is used to inform, reward, and/or motivate behavior. The success of feedback may work through the explicit awareness of the discrep-
ancy between the attained and
goal states. Providing feedback
that indicates that a goal has not
been achieved is thought to create
discomfort (cognitive dissonance) or
motivation for change.

The problem with relying too
heavily on feedback, however, is
that it is dependent on patients
having clear goals, being moti-
vated to attain a predetermined
level of performance, and having
enough information to understand
behavioral options to improve
performance. Feedback is best
provided in comparison to a goal
state. It is best if the goal state is
generated by patients and providers
through collaborative goal setting. If
not generated by patients, the data
used as a comparison with the cur-
rent goal state may be a normative
comparison (e.g., provide the clinic,
regional, or national standards that
a patient should attain), or ipsative
comparison, with previous patient
performance. Whatever data source
is used to set a goal, the relevance
and credibility of the comparison
data should be considered from the
patient’s perspective.

**Problem-based learning.** PBL is
an inductive approach to teaching.
It starts the problem-solving cycle
with a relevant self-management
problem and ultimately leads to
solutions that may be generalized to
other problems.22 This is in contrast
to traditional didactic lecture-format
educational methods that begin the
learning process with a higher-order
concept (such as the importance of
A1C values) and may end up with
application to a relevant self-man-
gagement problem.

In comprehensive interventions,
written scenarios or multimedia
stories may be provided that begin
with a self-management problem and
then model problem solving using
one or more possible solutions. The
modeling of skills has been shown to
increase skill self-efficacy,23 and PBL
may provide greater patient motiva-
tion for problem solving compared
to didactic approaches. The PBL
approach has been successfully used
in medical, science, and math educa-
tion and has been applied in diabetes
education.24,25

The PBL approach is based on
learning in recurring cycles. Patients
and clinicians may start out with
high expectations to solve a problem
with one attempt. However, problem
solving is best taught through cycles
because barriers to adherence may
need to be addressed more than
once and possibly with different
approaches or resources.

**Patient-centered motivational
logic.** Although recognized as
important, most aspects related to
engaging patients in problem-solving
interventions are not well studied.
Engaging in self-management behav-
iors may be motivated, more or less,
by a desire for better health and bet-
ter quality of life. However, this is not
typically enough to maintain adher-
ence. Some benefits of adherence,

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<th>Table 1. Steps of Diabetes Self-Management Problem Solving</th>
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<tr>
<td><strong>Problem-Solving Step</strong></td>
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<td>Problem identification and awareness</td>
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such as those related to losing weight, may provide immediate rewards. However, the benefits of adherence are generally realized in the future. Using the future risk and benefits of health behaviors to guide immediate behavior is particularly difficult.26

There are two ways that problem-solving interventions can address this motivational issue. One is to create diabetes problem-solving scenarios within a PBL approach so that problem solving and self-management are explicitly linked to short- and long-term benefits, such as improved appearance, increased energy, functional mobility, or fewer visits to the doctor. The second method to improve engagement and motivation is to utilize naturally rewarding activities within the program.27 This could be achieved through online peer-based social interactions for advice and support. Peer-centered interventions are thought to have great potential for improving engagement and feasibility of behavioral-change programs in diabetes. Alternately, successful problem-solving support has been provided on an individual basis or in patient groups within the clinic.18

**Patterns of adherence.** Patients face their biggest challenges to adherence after they walk out of the clinic. At that point, diabetes knowledge and regimen recommendations are no longer a set of abstract rules and pieces of information but are one part of an array of life tasks, goals, and priorities that patients juggle. A number of important psychosocial factors influence the crucial relationship between knowledge of health, diet, and exercise and subsequent action. Each decision about taking care of diabetes is made within a web of individual resources, skills, and abilities, changing situational influences, emotions, and motivations. Different types of barriers will result in different patterns and severity of nonadherence. Some barriers, such as a lack of medications and supplies or low diabetes literacy, are crucial to address and affect many self-management tasks. The barriers that broadly affect many self-management behaviors should be identified first, given their potential leverage for improvement.

**Psychosocial barriers.** In addition to potential barriers related to health literacy and low financial resources, many of the challenges diabetic patients face are psychosocial in nature.28 Psychosocial barriers may be best conceptualized as interactions between external conditions and patient beliefs, skills, motivations, and emotions. Examples of psychosocial barriers to adherence include embarrassment, communication issues, or inadequate planning for challenging situations.

Some psychosocial barriers will cut across more situations and tasks than others and thus may provide a good focus for problem solving. Feeling embarrassed about diabetes may affect many self-management tasks and act as a more frequent or generalized barrier. Similarly, depression or burnout will likely have more of a blanket effect and cut across situations and tasks. Depression is present in a substantial portion of adults with type 2 diabetes, significantly influences adherence, and should be routinely assessed.29 Other barriers may be linked to specific tasks, a particular time of day (e.g., checking blood glucose in the mornings), or even to certain individuals who interact with the patient in a manner that has a negative effect on adherence.

One commonly reported and clinically frustrating psychosocial barrier to adherence is “forgetting.” This may not appear to be very useful information in focusing problem-solving efforts, but forgetting may be “unpacked” for meaning. When a patient reports forgetting, it may indicate competing priorities or motivated resistance to self-management. Competing priorities simply indicates that life events or other life priorities other than diabetes self-care were more interesting, relevant, or deserving of attention. In this type of adherence problem, simple solutions, such as reminders and alarms, may be useful.

Motivated resistance to self-management or using an avoidant coping style may be less amenable to instrumental support such as reminders. Introducing problem-solving skills training without additional support for these individuals is not likely to
be successful because they may not be able to identify or accept problems. For these individuals, it may be best to start the process of improving adherence with experiences that could positively draw their attention to diabetes, such as motivational interviewing.30

**Methods to implement programs.** Effective diabetes problem-solving programs will include a feasible, accessible, and population-appropriate mechanism for modeling problem solving along with regular communication regarding the application of the problem-solving cycle to self-management barriers. These functions have been successfully supported in whole or part by a number of currently available technologies including telephone, e-mail, Internet, and mobile technologies such as cell phones.13,31–34 Utilization of these means of providing the content for learning problem solving and communication about the process will allow more frequent learning experiences and may enhance the effectiveness, reach, feasibility, and sustainability of programs.

The Internet provides a rich means by which to provide content, monitoring, and clinical support to many patients. Approximately 77–83% of families in the United States regularly use the Internet.35 For those at age 55, utilization of the Internet is lower (64%), and use decreases substantially as age increases.35,36 The key in using the Internet across different populations within one clinic is to integrate alternate or additional means for administering programs. For example, it may be best with older adults to integrate complementary teaching methods, such as paper-based instruction, face-to-face instruction, or ubiquitous technologies such as home phones.

**Issues in Implementing Self-Management Problem Solving Within the Clinic**

Although self-management problem solving has broad utility in improving adherence, it may be the behavioral component of chronic care management that receives the least attention.37 Although collaborative problem solving has been recommended as part of a comprehensive diabetes self-management education program, thought leaders and researchers have identified two seemingly conflicting recommendations for implementing programs to support these patient skills: the Chronic Care Model has specified that diabetes self-management education should be integrated into primary care.38,39 but primary care providers are much more likely and able to utilize these programs if they are administered largely outside of the clinic.40–45

One current model of implementing self-management programs in clinical settings is to utilize minimal clinic resources to introduce a patient to the intervention and provide accountability and monitoring, but to administer the majority of the intervention outside of the clinic, through the Internet or other more accessible modalities.31,40,44,45 Although interventions have been designed to address these needs, there is currently a gap in translating research into practice, and clinicians have limited referral options for feasible programs. A recent survey reported that specialists and primary care physicians identified a lack of referral options as one of the top three barriers to acceptance and use of diabetes self-management education.46

**Measuring relevant processes.** In addition to the beliefs noted above, one of the most fundamental challenges in supporting problem solving in research and clinical settings is in accurately measuring self-management behaviors, barriers to self-management, and problem solving. All are typically measured using participant self-report, which is subject to issues with memory and response bias.47 Recent efforts to measure self-management and other health behaviors in real time using mobile technologies are promising.38 For example, recent research has identified the value in using cell phone cameras to document food choices and quantities.48 Many mobile systems provide assessment that is closer in time and proximity to the actual barriers to self-management but still rely on self-report. However, any automation or mobile monitoring of health behaviors will make the integration of adherence data into clinical management much more feasible.

**Effective longitudinal approaches.** Long-term models for implementing problem-solving programs have not been identified. Although it is clear that barriers to self-management will emerge and change over time, it is not clear how patients habituate to problem-solving interventions. It is unlikely that individuals want to work at learning problem solving for an unlimited or extended period of time (if it is perceived as work). Even with seemingly engaging programs, there is an inevitable drop in engagement and attrition over time.13 It may be that intensive self-management skill-building interventions are best used intermittently as needed or as relapse-prevention mechanisms triggered by risk factors monitored by the health care system. Ongoing interactions with problem-solving support resources, such as peer forums or discussion boards, could be used by the patient as needed.

**Collaborative Problem Selection and Barrier Identification**

One broad issue that could affect the success of problem-solving support
is the quality of patient-provider collaboration. Health care providers may implicitly focus on the need for patients to change their lifestyle to accommodate diabetes self-management. Patients more typically view self-management tasks as modifiable and seek to adapt or change self-care recommendations to fit their own needs and lifestyle choices. It follows that patients and providers may differ regarding what constitutes a problem with adherence. From the clinicians’ perspective, a problem exists when self-management tasks are not carried out with the appropriate frequency or quality. From the patients’ perspective, a problem may exist only if there are personally relevant, salient, and immediate negative consequences. Those consequences may or may not relate to health status but may relate to psychosocial or socioeconomic factors. Additionally, negative consequences may be associated with carrying out, or not carrying out, the self-management task.

Several aspects of self-management barriers could be used to identify focused patient problem-solving efforts. Patients may be motivated to focus on those barriers that cause distress or anxiety or that have salient secondary effects in time and money. However, clinicians may wish to steer patients into selection of a problem that has the greatest immediate impact on the stability of blood glucose levels. The challenge to providers is to support patients in their unique efforts toward problem solving while still providing expert advice and guidance when patient and provider priorities are at odds. For the most part, it will be more motivating and ultimately sustain patient problem-solving efforts for patients to decide on the focus of their own problem solving. By supporting patients in the autonomous selection of adherence barriers while still providing expert insight regarding the nature of the clinical impact of the barrier, providers can strengthen the provider-patient relationship.

Summary

Few topics are more important than patient adherence in improving long-term outcomes and reducing avoidable health care costs. Problem-solving skills have a central role in improving patient adherence. Barriers to providing problem-solving support within the clinic are time, resources, and limited referral options for feasible and disseminated programs. More recent self-management programs that include problem solving typically involve minimal clinic time and resources, with most of the patient activities monitored and implemented outside of the clinic.

Priorities that have been identified to improve patient referral options include increasing diabetes translational research, creating programs that are feasible across clinical settings, and creating interventions that are sustainable. Once these priorities have been manifested in effective and adaptable programs, clinicians will be able to select and implement feasible interventions that are appropriate for their settings, resources, and populations.

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Shelagh A. Mulvaney, PhD, is an assistant professor in the School of Nursing and Department of Pediatrics at Vanderbilt University Medical Center in Nashville, Tenn.