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

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Only 36% of adults with type 2 diabetes meet the American Diabetes Association recommended target of 7% for A1C.[1] Adherence to intensive treatment has been shown to improve diabetes outcomes[2,3] and may reduce disparities in outcomes that exist between white and ethnic minority patients.[4] 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.[5] 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.[6–8]

Problem solving is recommended as a core facet of diabetes self-management education for adults, younger patients, and caregivers or family members.[9] 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.[10–20] 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.

Table 1 shows the steps of self-management problem solving: problem awareness, barrier identification, solution generation, implementation planning, implementation, outcome evaluation, and revision. Although the steps of problem solving are straightforward, breakdown often occurs in the application of the process. Similar to low adherence, this is because of the nature of barriers patients face, the nature of supports needed and available, and the need for adequate ongoing motivation for the work.

IN BRIEF

Problem solving about barriers to self-management is an essential patient skill. This article provides an outline of the problem-solving process and a review of some components of problem-solving interventions. It identifies issues regarding implementing problem-solving programs to improve adherence and discusses ways to support problem solving within clinical settings.

Components and Methods of Problem-Solving Interventions

Research and theory have identified key components of problem-solving programs. Diabetes research, behavioral theory, and research in other chronic illnesses and from the learning sciences contribute methods that may enhance the effectiveness of problem-solving programs: feedback, problem-based learning (PBL) techniques, incorporation of patient-centered motivational logic, identification of patterns of adherence and related barriers, and implementation methods that allow patients regular access to skill-building activities and support.

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.[21] The success of feedback may work through the explicit awareness of the discrep-

Table 1. Steps of Diabetes Self-Management Problem Solving

Problem-Solving Step	Description	Patient Example
Problem identification and awareness	Identification of the problem	My A1C is too high.
Barrier identification	Identification of why the problem is happening	I don't exercise. I have no time.
Solution generation	Identification of several possible ways to solve the problem	I have time on the weekends. I could ask my husband to pick up the kids two days per week.
Implementation planning	Identification of the specific steps in the solution; identification of possible barriers to implementing the solution; planning; taking preliminary steps	I will talk to my husband this weekend about the schedule. If he is not available, I will ask my neighbor to watch my kids after work. I will plan on taking a walk Sunday afternoon. If it is raining, I'll go to the pool.
Implementation	Intention, situational awareness, and decision-making	OK, NOW is the time to take that walk. I need to get off the phone.
Evaluation	Evaluation of the success of, and reasons for, outcomes	I didn't ask my neighbor to watch the kids. I am worried that she will say yes, but not really want to do it. I did take a long walk!
Revision	Revision of any aspect of the previous steps to increase probability of success	I need to talk to my neighbor and make sure she is OK with watching my kids. I will increase the number of walks I take.

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 motivated 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 current 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-management 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 motivation for problem solving compared to didactic approaches. The PBL approach has been successfully used in medical, science, and math education 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 behaviors may be motivated, more or less, by a desire for better health and better quality of life. However, this is not typically enough to maintain adherence. Some benefits of adherence,

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]

Problem awareness and barriers to adherence. The first, and arguably the most important, step of problem solving involves identifying that one has a problem at all, or problem awareness. As mentioned, awareness of a problem may be created by feedback regarding recommendations for self-management behaviors and patient self-reported levels of those behaviors. The second step is to identify barriers to self-management or reasons for the problem. For some patients, this is the most difficult step.

One approach to identifying barriers to adherence is to take a PBL approach and reverse-engineer the discussion with the patient. That is, start by identifying a problem or a discrepancy between a self-management recommendation and completion of that task. If a more comprehensive assessment of adherence is not possible or a patient reports full adherence in the face of conflicting data, it may be best to start the discussion by asking about the last time the patient did not take care of diabetes in the way that he or she should have. By initially focusing on specific events or problems, these events may be used as examples of generalizable issues that affect a range of self-management tasks.

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.[40–43]

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.[48] For example, recent research has identified the value in using cell phone cameras to document food choices and quantities.[49] 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.[50] 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.[51,52]

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.[53] 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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