

Optimizing Diabetes Self-care in Low Literacy and Minority Populations—Problem-solving, Empowerment, Peer Support and Technology-based Approaches

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Improved glycemic control among patients with type 2 diabetes has been shown to reduce excess morbidity and mortality.¹ Daily behaviors and activities (diet, physical activity, blood glucose monitoring, foot care, and medication adherence) are key components in maintaining good glycemic control and are therefore critical for effective diabetes management. Patient-level factors have been shown to account for up to 95% of the variance in glycemic control.² As such, great emphasis has been placed on implementing behavioral interventions targeting diabetes self-management (DSM) education and skills, particularly among ethnic minority and low-income populations that bear a disproportionate burden of diabetes and have poorer glycemic control.¹

In this issue of the journal, Hill-Briggs et al.³ examined the feasibility, acceptability, and effectiveness of a problem-based, DSM training adapted for low literacy populations on glycemic control. They showed a significant change in hemoglobin A1c that was diminished by controlling for patient's problem-solving skills, suggesting that problem solving is a key component for glycemic control. Problem solving coupled with diabetes education for improved knowledge boosts behavior change as it confers more effective coping⁴; however, DSM often requires multiple concurrent and consecutive behavior adjustments that can be overwhelmingly difficult to learn and to maintain for patients with diabetes. The article is interesting and clinically relevant; however, problem solving is one of several strategies to optimize diabetes control in low literacy and minority populations. Although teaching problem-solving skills to individuals with diabetes is an important component of DSM, self-efficacy, empowerment, and social support⁵⁻⁸ are also critical for them to achieve balance in managing their daily lives and understand how improvements in diabetes management behaviors can be sustained.

Improving clinical outcomes for low literacy and minority populations is challenging and requires a multi-pronged approach. It is important to note that tailoring an intervention for low literacy populations may not be as effective as building an intervention specific for populations with low health literacy. Health literacy, distinct from educational attainment,

is conceptually defined as the ability to read and comprehend medical information⁹ and operationally defined as the ability to effectively apply medical instructions to improve and maintain a good state of health. Adequate health literacy is essential to navigation of the health care system (making specialist appointments, adequately preparing for routine blood work or preventive health exams, and understanding insurance rules and regulations) and following complex 'if-then' directions for taking insulin and other diabetes medications. As a result, populations with low health literacy (generally ethnic minorities, low income and older adults) are less likely to use preventive services, more likely to utilize expensive emergency department resources,¹⁰ and more likely to have poorer glycemic control and develop diabetes-related complications such as stroke and retinopathy.¹¹ Studies using path analysis to examine the link between health literacy and glycemic control strongly suggest that health literacy has an indirect effect via diabetes knowledge,¹² social support,⁸ and self-efficacy.¹³ Therefore, DSM interventions for low literacy populations need to incorporate these factors.

Interventions that include an empowerment approach are more likely to improve the interaction of patients and providers in collaboratively improving both short-term and long-term diabetes-related outcomes. Empowerment of patients enables them to increase awareness of their diabetes condition, to address their psychosocial and cultural needs, and to learn how to take responsibility for their daily self-care.¹⁴ At the same time, providers have to take on the role of keeping their patients informed of their current condition and treatment options, while guiding them through achieving goals, helping them overcome barriers, and providing appropriate care recommendations and expert advice. Studies using empowerment-based DSM interventions demonstrate significant improvements in glycemic control.¹⁴ However, the difficulty of incorporating daily behavioral changes has led researchers to examine whether increasing social support can serve as an adjunct to clinical management of diabetes.

In order to attain better control of various aspects of diabetes management, patients need to garner their own support, generally in the form of family or friends. However, their own social networks may be inadequate to serve as a foundation for informal support. Earlier studies revealed the effectiveness of diabetes support groups in better self care and improved glycemic control.¹⁵⁻¹⁷ More recently, peer support has been found to be a potential resource for diabetes self-management. A review article examining peer support proposed its effectiveness

through instrumental and emotional support as well as mutual reciprocity of medical needs (i.e., shared medical issues and problem solving).¹⁸ In the range of peer support interventions examined in this review, individuals who were empowered to serve as mentors or were community health workers helped improve self-care behaviors among those with chronic disease conditions.¹⁸ A study examining the effect of telephone-based reciprocal support from peers (given behavioral skills training) and periodic nurse case management on glycemic control following an initial face-to-face, group-based session among veterans with diabetes¹⁹ found that those receiving peer support achieved A1c levels that were 0.58% lower on average than those receiving case management at 6 months. Therefore, randomized trials have demonstrated promising clinical and behavioral outcomes, with peer support interventions improving glycemic control,²⁰ healthy eating, patient activation, self-efficacy, and communication with physicians.²¹

More recent research suggests that technology-based interventions facilitate teaching and maintenance of DSM behaviors. The Veterans Affairs health care system has one of few centralized, nationwide electronic health records that have allowed researchers to initiate studies on health information technology services. These services address the support needs of patients with multiple challenges to disease self-care, including multi-morbidity, health literacy deficits, and limited treatment access.²¹ A prime example includes patient-to-patient interactive voice response (IVR) calling systems and assessments through IVR with feedback to informal caregivers. Other technologies include the use of mobile phones and Web-based programs. There are also a variety of new health technologies designed to improve self-management and meet the needs of specific populations with type 2 diabetes, especially those having a complex daily self-management regimen for multiple comorbid conditions, low health literacy, limited access to treatment due to travel distance or lack of specialty care barriers, and poor informal support systems.²¹ More automated systems allow patient-specific data to be clinically useful and readily accessible to providers. Furthermore, growing advancements in technology will allow for greater cross-talk between systems and has high capability of greater diffusion and accessibility.

An area of research on the frontier of behavioral research is telemedicine-based interventions. The efficacy of telephone contacts in improving health outcomes has been documented in multiple randomized controlled trials. Among 272 veterans with poorly controlled diabetes, those randomized to automated telephone disease management with an as-needed nurse providing follow-up versus usual care showed better glycemic control after 12 months.²² A systematic review of telephone-delivered diet and physical activity interventions showed significant positive outcomes for interventions as brief as 3–6 months long with six or more phone contacts.²³ Another randomized study of 636 patients receiving a multi-component telephone-delivered behavioral self-management intervention, home blood pressure (BP) monitoring, combined intervention, or usual care²⁴ showed a significant BP-lowering effect from the combined intervention, while the separate interventions showed no difference. A telehealth study of 41 patients with diabetes used a care coordination approach to monitor BP, lipids, and medications, then categorize them as high or moderate cardiovascular risk.²⁵ Subsequent follow-up by a care coordinator guided patients regarding medications, diet and exercise, glucose monitoring, and coping with chronic conditions, which led to significant

reductions in 10-year cardiovascular risk. These trials suggest that telehealth-delivered behavioral interventions can improve modifiable risk factors and allow easy reach, reduce transportation problems, and provide access for geographically distant patients. Newer technologies also allow for easy tracking of behavior in real time (e.g., transmission of self-collected glucose/BP readings to a server can be used to track daily self-care adherence), and allow titration of treatment and feedback by the provider at the same time.

However, there are still challenges to improving clinical outcomes for low literacy and minority populations with diabetes using behavioral interventions. One important area is achieving control of multiple outcomes that share common behavioral risk factors (e.g., diet, physical activity, smoking cessation, and medication adherence). Another is documenting long-term benefits for behavioral interventions for diabetes beyond 12–18 months. Behavioral intervention studies that target multiple clinical outcomes (e.g., blood glucose, blood pressure, lipid, and weight control) and track outcomes over longer periods (e.g., 2 or more years) are needed. These studies will likely require more intensive and longer intervention duration and may require multiple approaches to behavior change (e.g., combining problem-solving, empowerment, peer support, and novel technologies), especially in minority and low literacy populations.

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