Interactive Multimedia Tailored to Improve Diabetes Self-Management

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KEYWORDS

• Type 2 diabetes • Technology • Rural adults • Self-management • Health literacy • Mobile applications

KEY POINTS

- Self-management of type 2 diabetes requires continuous complex decision making.
- Many rural dwellers struggle with health literacy.
- Mobile technology applications (apps) can offer ready access to health information.

Nearly 10% of the United States population has diabetes, and of these 29.1 million people with diabetes only 21 million have been diagnosed.[1] Most adults have been diagnosed with type 2 diabetes. Economically the impact of diabetes continues to soar, with 2012 data indicating combined direct and indirect costs of $245 billion.[1] Human costs associated with this chronic health problem are also devastating. Complications associated with diabetes can include blindness, amputation, painful neuropathy, and chronic kidney disease.

Diabetes, like many chronic illnesses, is more prevalent in rural than in urban areas.[2] Health disparities common in rural areas such as fewer health care providers,[2,3] lack of

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transportation,[3] lower health literacy, and lower income[3] increase the challenges for effective self-management of diabetes. Navigating the daily requirements of life with diabetes requires much time, knowledge, a commitment to a healthy lifestyle, and an encouraging, accessible health care provider who facilitates the development of problem-solving skills. Individuals living with diabetes must make decisions regarding food intake, physical activity, medications, and health maintenance that are often based on brief initial education and infrequent visits to the health care provider, placing most of the responsibility for daily decisions regarding health on those living with diabetes.

Self-management education is necessary for those who hear the words "you have diabetes." Visions of relatives who experienced negative outcomes, frustration with a change in diet, and multiple daily injections may conjure up feelings of denial, anger, and depression as part of the fear of the unknown. For those who lack access to diabetes education, such as many rural dwellers, the fear continues. Even those who do participate in self-management education following the initial diagnosis struggle to maintain the momentum of daily vigilance over the long term. Consequently, most adults living with diabetes rely on quarterly visits to a health care provider who may not be adept at facilitating development of problem-solving skills, and who is rarely available to answer all self-management questions. Education handouts designed to teach skills for living with diabetes may not be easily understood, and may lead to further anxiety and confusion. For those living in rural areas, these challenges are magnified and contribute to a life expectancy reduced by 2 years for rural populations in comparison with urban dwellers.[4] Surprisingly, responses to the 2007 Behavioral Risk Factor Surveillance Survey indicated that rural dwellers exhibited better diabetes self-care behaviors than urban residents, even with the lack of resources typically available to those living in rural areas.[5]

Technology offers opportunities to increase knowledge and learn new skills. Most adults (85%) report owning a cell phone, and many of these individuals download and use applications[6] or seek health information online, particularly those living with chronic illnesses such as diabetes.[7] Although many mobile applications (apps) designed for people living with diabetes aim to enhance understanding of the disease, most are focused on blood glucose monitoring and recording; we were unable to locate any apps that provided a comprehensive, plain-language approach to self-management for those who live with type 2 diabetes and their loved ones. Mobile sources of reliable, evidence-based health information can bridge the gap between infrequent appointments with the health care provider.[8]

PURPOSE

A lack of available health care providers trained to help manage diabetes in rural areas, combined with patients who have not been taught about healthy living and have few available opportunities for additional health education, means that those living with diabetes are much more likely to have negative diabetes-related experiences. Given the challenges facing all adults living with diabetes, and the additional barriers faced by those living in rural areas who potentially also struggle with health literacy, a need exists for evidence-based accessible information. The purpose of this project was to pilot a program to improve self-management of type 2 diabetes in rural adults. Specifically, the project aims were to demonstrate that participants can effectively use the novel iOS-based, tailored intervention to improve diabetes self-management in a rural Southern US county, and to determine predictors of successful usage among this rural population living with type 2 diabetes.