

# Smartphones for diabetic patients

Cellular phones - once a luxury used strictly for talking - have taken on many new roles in recent years. Now researchers at Saint Louis University and Old Dominion University in Virginia say smartphones can be used to help elderly diabetics manage their health and learn more about their condition.

A team of researchers from business, engineering, medicine and public health, as well as practitioners and researchers in China, designed the smartphone technology, which includes interactive games and easy-to-use logging features, especially for elderly Chinese diabetics. They presented their research on Thursday, 29 October in Washington, D.C. at the mHealth Summit, a public-private partnership of the Foundation for the National Institutes of Health.

Initial studies of the interactive diabetes self-management system, called the Chinese Aged Diabetic Assistant (CADA), are promising, researchers found. The system enables diabetics to track their blood glucose, weight, diet, exercise, mood and blood pressure - valuable information that will assist their doctors in providing the best care possible.

"We know that patients with chronic illnesses who are actively involved in their health care have better outcomes, yet this can be a challenging task. Mobile technologies can empower elderly people to better understand diabetes, track their health indicators more closely and follow a healthier lifestyle," said Maggie Jiao Ma, Ph.D., assistant professor at SLU's Parks College of Engineering, Aviation and Technology.

## About the research

Diabetes is a serious problem in China affecting more than 40 million men and women. For the aging Chinese population, diabetes is a costly, chronic condition and a major cause of disability. Especially in rural areas of China where diabetics have less access to health care, there are many misconceptions about the disease and proper treatment.

Ma and Cindy LeRouge, Ph.D., associate professor of decision sciences and information technology management at SLU, travelled to China in 2008 for several weeks to learn more about the problem and how they could best use technology to improve the health of elderly diabetics.

"This project did not start out as a gaming project," LeRouge said. "But we did a lot of groundwork - from looking at the health care infrastructure in China to conducting focus groups with older diabetics and interviewing various providers - and found that gaming was a persuasive way to engage patients in managing their personal health."

The games vary in purpose. For example, researchers created a "food pyramid" type game, which encourages gamers to eat a balanced diet, limit high-sugar foods and watch their daily intake of fat and salt. Applications including a trivia game and a tile matching game, in which gamers connect the necessary components for a healthy lifestyle, were popular

educational choices among the test group.

While games engage and motivate the patients, smartphones makes the technology convenient.

First, smartphones are mobile, meaning patients can use them at any time or any place. They can be used as small, inexpensive computers even if no network infrastructure is in place. If connections are in place, smartphones make it easy for patients to share health information with their providers, care givers and others within personal network. Also, because many users are already mobile phone owners, including some smartphone users, adapting the technology is feasible for patients, providers and hospitals.

Smartphone technology may even offer a solution to better managing health care costs for chronic conditions, says Mark Gaynor, Ph.D., associate professor of public health at the School of Public Health.

"The only way to cut the cost of caring for people with chronic conditions is to enable the patients to self manage their health. In order to do that, though, self-management must be reasonable and easy to do. Smart phone technology makes it easy for patients to track important health information."

## **Endless opportunities**

There are almost endless opportunities for using smartphone technology in health care, researchers say.

"Imagine walking into a McDonalds and having your cell phone recognize your location and make healthy menu recommendations - all this and more is possible with smartphone technology," Gaynor said.

Researchers say smartphones can make tracking one's health easier and more convenient. In the future, CADA users will be able to share information with their providers and receive important health reminders. They are also working on Bluetooth-enabled devices, such as a scale that communicates with the phone to record and track daily measurements and a blood sugar monitor that automatically records daily readings on the phone.

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