Chapter 15
Application of Handheld Computing and Mobile Phones in Diabetes Self–Care

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EXECUTIVE SUMMARY

Advances in technology have accelerated self-care activities, making them more practical and possible than before using these technologies. The utilization of new Health Information Technologies (HIT) is becoming more and more apparent in self-care. Many patients incorporate the use of PDAs in diabetes self-care (Forjuoh, et al., 2007; Jones & Curry, 2006). Mobile phones are used in diabetes self-management by diabetes patients (Carroll, DiMeglio, Stein, & Marrero, 2011; Faridi, et al., 2008; Mulvaney, et al., 2012). Also, reminders based on SMS cell phone text messaging are used to support diabetes management (Hanauer, Wentzell, Laffel, & Laffel, 2009). Given the current advances in the field of health care, health care technologies, and handheld computing, this case explores the possible primary usages of mobile phones, PDAs, and handheld devices in self-care management. More specifically, the case illustrates how such technologies can be used in diabetes management by patients and health care providers.

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BACKGROUND

For people with chronic diseases like diabetes, technical convergence makes even more sense. With medications, pumps, glucose and pressure meters, insulin injections, and the need of health care providers to track and document different kind of signs, so patients with diabetes are able to welcome a bit of help from technology (Beckley, 2005).

Handheld computing has been utilized in four large clinics in a hospital located in a large university, multispecialty group practice associated with 186,000 member of Health Maintenance Organization (HMO) have employed the use of PDAs in diabetes self-care by patients with type 2 diabetes. The four clinics are affiliated with the Central Texas Primary Care Research Network which is a primary care practice based research network located in Temple, Texas within the Scott and White Health System of the Texas A&M Health Science Center College of Medicine (Forjuoh, Reis, Couchman, & Ory, 2008; Forjuoh, et al., 2007). A diabetes center in Boston, Massachusetts has used a computerized automated reminder diabetes system based on SMS cell phone text messaging to support diabetes management (Hanauer, et al., 2009).

A family medicine clinic located at the college of medicine at Pennsylvania state university has assessed the use of a PDA based electronic management system in a primary care office (The family clinic). There were 58 patients and 1 physician. In addition, there was a control group of 115 patients seen by 1 of 5 other physicians. All patients were with type 2 diabetes (Jones & Curry, 2006). Two Community Health Centers (CHC) located at Connecticut have evaluated the impact of using mobile phones on type 2 diabetes patients’ self-management. The clinics have similar demographic characteristics and they were randomly assigned for the intervention and control of thirty patients with type 2 diabetes (Faridi, et al., 2008). A University Medical Center has tested the use of mobile phones to measure adolescent diabetes adherence for patients from a large academic diabetes clinic. Only patients with type 1 diabetes for at least one year are involved in the test (Mulvaney, et al., 2012). Diabetes clinics at the James Whitcomb Riley hospital for children, Indianapolis, Indiana have tested the use of cell phone based glucose monitoring system for adolescent diabetes management by patients with type 1 diabetes for at least 1 year (Carroll, et al., 2011). The department of engineering science at university of Oxford in collaboration with e-San Ltd have developed a real time, mobile phone based telemedicine system to support patients with type 1 diabetes, the software system was implemented on a Motorola T720i phone and a One Touch Ultra blood glucose meter (Farmer, et al., 2005).
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