Supporting Diabetes Self-Management with Pervasive Wireless Technology Solutions

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ABSTRACT

Diabetes is one of the leading chronic diseases affecting Australians and its prevalence continues to rise. Diabetes is therefore becoming a serious challenge for both the quality of healthcare and expenditure in the Australian healthcare system. The goal of this study is to investigate the application of a pervasive technology solution developed by INET in the form of a wireless enabled mobile phone to facilitate superior diabetes self-management.

Keywords: Diabetes, Healthcare, Pervasive Technologies, Self-Management, Wireless

INTRODUCTION

Diabetes is one of the leading chronic diseases affecting Australians and its prevalence continues to rise with an estimated 275 Australians developing diabetes daily (DiabetesAustralia, 2008). Evidence shows that diabetes and its complications are incurring significant costs for the health system in Australia including costs incurred by patients, carers, government, and the entire health system. Only in 2004-05 direct healthcare expenditure on diabetes was A$907 million which constituted approximately 2% of the allocatable recurrent health expenditure in that year (AIHW, 2008). Further costs include societal costs that represent productivity losses for both patients and carers. Diabetes can, therefore, have considerable social, human, and economic impacts and tackling these requires solutions that substantially enhance the existing fragmented and uncoordinated capacity for effective prevention, early detection and management (VictorianGovernment, 2007).

Since diabetes is and is expected to be a major challenge for the Australian healthcare system in both providing quality healthcare and in recurrent increasing expenditures (Swerissen & Taylor, 2008), a treatment imperative is required that provides patients with appropriate levels of monitoring ensuring diabetes contain-
ment and prevention of further complications (AIHW, 2008). A pervasive technology solution would offer the necessary monitoring that is cost-effective and convenient to both patients and clinicians and least disruptive to patient lifestyle. The goal of this paper is to investigate the application of a pervasive technology solution developed by INET International in the form of a mobile phone to facilitate superior diabetes self-management in Australia.

CURRENT AUSTRALIAN HEALTH SCENE

Both healthcare professionals and diabetes patients require quality information if disease conditions are to be effectively managed. Extant research shows that there are several deficiencies in the information provided by the existing system for monitoring diabetes in Australia (Dixon & Webbie, 2006; Sprivulis et al., 2007; Swerissen & Taylor, 2008). First, data collected in hospitals are episode-based rather than patient-based which makes it difficult to determine statistics concerning individual admissions, re-admissions, and treatment patterns. Second, there is lack of data on incidence and prevalence by diabetes type that can help reliably assess the magnitude of the problem. Third, the accuracy of recording data in administrative data sets, such as hospital morbidity, mortality and general practice data is uncertain. Finally, clinical management information is derived from uncoordinated and fragmented data collections that are not representative of the entire population of diabetes patients making comparison, analysis and trend identification difficult.

These deficiencies are the result of the current health system set up. Based on fee-for-service episodic doctor-patient consultation, the current Australian healthcare system can handle short-term illnesses involving a limited range of interventions including their diagnosis and treatment (Hunt, 2007). However, this system is comprised of a mixture of fragmented private and public healthcare subsystems that provide both healthcare funding and delivery. Largely uncoordinated, these subsystems are deemed to be unsuitable for the treatment of long-term chronic diseases including diabetes (Dixon & Webbie, 2006; Sprivilis et al., 2007). In particular, diabetes requires teams of various health professionals and long-term support to help sufferers make effective healthy lifestyle changes and constantly maintain them (Hunt, 2007).

CURRENT SELF-MANAGEMENT RESEARCH

As there is no cure for diabetes, non-medical approaches are used jointly with medical approaches so that patients can have a life which is as normal as possible. However, non-medical approaches can be challenging as they require effective lifestyle management and meticulous attention and monitoring by both patients and healthcare professionals (Britt et al., 2007). Particularly, to be successful, patients need to be both informed and active in their treatment regimen (AIHW, 2007, 2008). This can be achieved by effective self-management which is a non-medical approach and which constitutes the focus of this paper.

Self-management is important as it empowers diabetes patients while acknowledging their central role and responsibility for managing their healthcare (ICIC, 2008). Extant research indicates that active participation of diabetes patients in self-management is a key strategy for managing their condition and reaching improved treatment outcomes (Colagiuri, Colagiuri, & Ward, 1998; Poulton, 1999; Rasmussen, Wellard, & Nankervis, 2001; Wellard, Rennie, & King, 2008). However, self-management is constantly time-consuming and requires significant self-discipline (Russell, Churl Suh, & Safford, 2005) and support strategies including assessment, goal-setting, action-planning, problem-solving and follow-up (ICIC, 2008). Moreover, because effective self-management may require patient interaction with various healthcare professionals, including general practitioners, diabetes educators, dieticians,
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