Can Mobile Applications Improve Non-Adherence in Diabetes Management?

With nearly 7% of the Canadian population diagnosed as of 2015, diabetes has remained a silent yet dangerous epidemic for decades [10]. Though advances in drug development, medical technology, and physician education make it possible for many patients to prevent and manage diabetes, there is an unsettling discordance between medical knowledge and clinical outcomes. An estimated half of Canadian patients fail to meet hemoglobin A1C targets, suggesting a high rate of non-adherence to recommended treatments [1,7,14]. In response to such concerns, mobile applications (apps) for patients with diabetes have emerged in the market with the goal of simplifying diabetes management. The Google Play Store alone lists over a thousand diabetes apps, and this number is projected to increase [12,17]. With the revolutionary integration of smartphone apps into our daily lives in the past decade, such apps show hope for making diabetes management more approachable and improving treatment adherence.

What has drawn 4.1 million users to the diabetes app market is the convenience and clarity apps offer to diabetes self-management [16]. A typical recommended regimen for patients with diabetes consists of diet and exercise, appointments, self-monitoring, and more in the context of other daily priorities- a daunting responsibility considering the devastating consequences of diabetes left untreated [2,6,9]. Adolescents with Type 1 diabetes who are already undergoing physical and psychological transition can find these responsibilities especially disruptive [Faulkner]. Since the mainstay of diabetes treatment lies in the motivation and availability of patients to implement the physician’s recommendations, patients can experience stress and frustration when these tasks become overwhelming [4,7,18]. Diabetes apps can help alleviate this tension by simplifying multiple domains of diabetes management into one platform and by relieving patients of some of the pressures of making their own health-related decisions.

The current diabetes app market consists of roughly two categories. The first are tracking/monitoring apps such as MyNetDiary, BGMonitor, and Glucose Buddy that allow users to record their blood glucose, exercise, carbohydrate intake, and medication regimens in visually appealing pie charts and trend graphs [12]. Some “gamify” treatments with virtual points to encourage users to achieve personal goals [3, 12]. The second category of apps have support/feedback, data transfer, and social media features in addition to tracking/monitoring features. These apps, which include Health2Sync, MySugr, and SocialDiabetes, provide timely advice in response to blood glucose levels. Some allow import of data from insulin pumps or fitness devices (i.e. Fitbit) and export of data to physicians. Many also feature community boards and messaging systems to help patients connect to other patients and family members [8, 11,12].

Features such as visual graphs, personalized feedback, and gamification can encourage patients to reflect on their progress and develop intrinsic motivation, thereby improving treatment adherence. These tools show hope especially for youth with diabetes, for whom analog monitoring methods have proven suboptimal due to high error rates, lack of data, and discontinuity of real-time feedback and motivation [8]. Furthermore, improved data availability to physicians and community support can provide more opportunities for education, which in turn can empower patients with a healthy sense of responsibility.

Of course, the rise of mobile diabetes apps is not without concern- those that do not follow clinical guidelines pose potential danger to patients [13]. In response to these concerns, some researchers and health care professionals (HCPs) have developed their own apps. Diabetes in Check and MyBCD, developed here in BC by the multidisciplinary team at BC Diabetes, are examples of such. In addition to the monitoring, feedback, gamification, and social media features of other apps, these apps allow patients to message nurse case managers or certified diabetes educators directly from their phones [3, 11]. This personalized and accessible expert care paradigm can further encourage patient adherence by developing a stronger sense of support and empowering patients to openly communicate realistic expectations with their HCPs.

Though more research is needed in this rapidly growing field, existing studies show promising benefits in lowered blood glucose levels and patient satisfaction [3, 15, 19, 20]. Evident in their high user ratings, mobile diabetes apps are already helping millions of users better integrate diabetes self-care into everyday lives [12]. With added features and HCP support, they have the potential to empower patients via an evolution from expert-led care to that of patient-physician collaboration, fostering motivation and responsibility. In effect, mobile applications may be a treatment for the issue of non-adherence in diabetes.

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