Chapter 4
mHealth Interventions for Self-Management of Chronic Disease

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ABSTRACT

Chronic diseases are long-term conditions that require ongoing medical treatment and are among the leading causes of morbidity and mortality worldwide, imposing a high socioeconomic burden. Self-management is a critical element of chronic disease management and requires considerable effort from patients. The pervasive adoption of mobile health (mHealth) technology has the potential to revolutionize healthcare delivery and support patients in the self-management of their chronic conditions—thereby improving health outcomes and reducing healthcare expenditures. Although a variety of mHealth interventions are widely used by diverse populations for chronic disease self-management, there is limited evidence regarding their efficacy. This chapter explores the literature regarding the effectiveness of mHealth interventions in the self-management of hypertension, diabetes, chronic obstructive pulmonary disorder (COPD), asthma, and cancer. The mHealth issues pertinent to each disease process are addressed, as are the areas that warrant further research.
INTRODUCTION

A chronic disease is broadly defined as a physical or mental health condition that lasts more than one year and requires ongoing medical attention and/or which limits activities of daily living. Chronic diseases can be managed through medications and lifestyle modifications, but generally cannot be cured. They are among the most prevalent and costly health conditions in the United States. According to the Centers for Disease Control and Prevention (CDC), six in 10 American adults suffer from at least one chronic disease and four in 10 adults have two chronic conditions or more (Centers for Disease Control and Prevention [CDC], 2019).

Chronic diseases can lead to hospitalization, long-term disability, reduced quality of life, and death. In fact, chronic conditions are the primary causes of death and disability in the United States and are the leading drivers of the nation’s $3.3 trillion in annual health care expenditures (CDC, 2019). Chronic diseases are responsible for seven out of 10 deaths in the U.S., killing more than 1.7 million Americans each year. In the U.S. alone, chronic diseases account for nearly 75 percent of aggregate health care spending, or an estimated $5,300 per person annually. In terms of public insurance, treatment of chronic diseases comprises an even larger proportion of spending: 96 cents per dollar for Medicare and 83 cents per dollar for Medicaid (Raghupathi & Raghupathi, 2018).

Current trends demonstrate that the number of individuals living with a chronic disease is only increasing. The nation’s aging population—coupled with existing risk factors (poor nutrition, lack of physical activity, and/or tobacco/alcohol use) and medical advances that improve health and extend longevity—suggests these problems are only going to magnify if not effectively addressed now. Thus, the understanding, management, and prevention of chronic diseases are important objectives in order to provide patients with higher quality health care and enhance their overall quality of life (Raghupathi & Raghupathi, 2018).

Along with the rise in chronic disease prevalence is the unprecedented rise in mobile phone use. Approximately 77% of adults in the U.S. and 36% of the global population currently own a smartphone (Pew Research Center, 2018; The Statistics Portal, 2019). Smartphone use has rapidly increased over the past 10 years (18% in the U.S. and 15% globally in 2009), and the number of worldwide users is expected to hit 3.8 billion by 2021 (The Statistics Portal 2019; Takahashi, 2018). The widespread adoption of mobile technologies is opening new and innovative ways to improve health and health care delivery. The rapid growth in mobile phone use has been accompanied by a huge expansion in health and health-related behavior apps, and more than 100,000 of these are used by over 500 million people (Alessa, Abdi, Hawley, & de Witte, 2018; Food and Drug Administration [FDA], 2018).
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