Chapter 32
Empowering Patients Through Digital Technologies:
The Case of Mobile Health Applications

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ABSTRACT

Mobile health initiatives aim to give patients more medical information and to empower them over their medical treatments. However, information overload and lack of digital literacy may hinder patient empowerment. This chapter investigates opportunities and challenges of patient empowerment and mobile health. The authors analyze the different definitions used in the literature to characterize patient empowerment and mobile health, discussing implications for all the care actors involved. Although the adoption rate of mobile technologies is at its infant stage and challenges still outweigh the benefits of patient empowerment, mobile health apps can foster the progress towards patient-centered care.

INTRODUCTION

The introduction and worldwide adoption of new information technologies are changing healthcare around the globe. A powerful combination of factors is driving this change. These include rapid advances in mobile technologies and applications, cloud-based computing and the exponential growth in coverage of mobile cellular networks (Dadgar & Joshi, 2018; Fox & Connolly, 2018; WHO, 2011).

In recent years, especially since the advent of smartphones, a vast number of apps have been developed to address different aspects of disease management or prevention including screening, symptoms tracking, stress management, medical support, habit building and providing a routine to give patients more power and control over their healthcare path (Varshney, 2014). There were more than 325,000

mobile health applications available in major apps stores and over 3.5 billion downloads in 2017 alone, reflecting a growth rate of 16% compared to the previous year (Research2Guidance, 2018). Researchers have attempted to understand the increasing use of mobile health applications and the way patients' role is changing by analyzing the adoption, the use and the consequences of mobile apps in the healthcare context, reviewing scientific literature, collecting empirical evidence of specific apps or conducting randomized controlled trials (Cerezo et al., 2016; Eskildsen et al., 2017; Klecun, 2016).

The pervasiveness of mobile apps in the healthcare industry suggests that their use has enriched doctor-patient communications and improved the delivery of care services (Boonstra & Broekhuis, 2010). The focus of care providers is shifting from productivity to quality of care and to positive experience for patients. This can be reached through timely health advice (Perera et al., 2011), promotion of compliance and adherence to medical treatments (Free et al., 2013), staying connected with health care provider(s), personal health management (Chatterjee et al., 2018; Dadgar & Joshi, 2018), self-care (Storni, 2014), and remote consultation (Manda & Herstad, 2015). Consequently, mobile health is composed of advanced technological tools with several benefits such as portable access to continuous streams of information, interactive functionality of the apps, monitoring patients remotely, and sending electronic alerts for disease control (Klasnja & Pratt, 2012).

Although the proliferation of mobile devices is continuously increasing because of reduced costs and diminished waiting times (Reychav et al., 2018), this phenomenon has not reached maturity yet. Some patients have had a positive experience using mobile apps to manage chronic diseases, while others have had a negative feedback because they became more dependent on care professionals, thus losing some of the advantages of patient empowerment. For instance, Ghosh and colleagues (2014) demonstrated how digital integration enhanced patients' psychological empowerment to manage a chronic disease.

Patients may benefit from using mobile apps as they acquire higher awareness of their care path or they are being facilitated in accomplishing routine tasks (Prgomet et al., 2009; Noteboom & Al-Ramahi, 2018; Marcolino et al., 2018). In contrast, others face several challenges with mobile apps because of the potential information overload due to cognitive constraints (Iyengar & Lepper, 2000) and the lack of expertise or digital literacy (van den Broek & Sergeeva, 2018; Fox & Connolly, 2018). Additionally, a recent study demonstrated that patient empowerment is an elusive ideal and on the contrary patients become more dependent on care professionals (van den Broek & Sergeeva, 2018).

The terms *patient empowerment* and *mobile health* have been used for several years, during which patients and medical staff have interpreted their meanings in different and sometimes contrasting ways. The absence of consensus over the definitions has led to misunderstandings among healthcare practitioners, researchers, policy makers and stakeholders alike. To make progress, it is crucial to take stock of existing knowledge.

This chapter investigates opportunities and challenges of patient empowerment and mobile health and discusses implications for care actors. After presenting the research methods, the authors review definitions of patient empowerment and mobile health. For each of these dimensions of "mobile health revolution", they examine the main benefits and challenges experienced by care actors. Finally, they conclude with the discussion of the implications of mobile health technologies for different stakeholders and directions for future research.

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