

## Chapter 2

# Mobile Health Systems and Electronic Health Record: Applications and Implications

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### ABSTRACT

*This chapter reveals the overview of mobile health systems; the adoption of mobile health systems; mobile health systems and patient monitoring; the overview of mobile health technology; the advanced issues of Electronic Health Record (EHR); and the challenges of EHR in global health care. Mobile health helps deliver the health care services with quality care, improved workflow, and increased patient interaction while minimizing complexity and cost to achieve the desired goals in health care settings. EHR systems are the real-time and patient-centered records that make information available instantly and securely to authorized users. The chapter argues that applying mobile health systems and EHR has the potential to improve health care efficiency and gain sustainable competitive advantage in global health care.*

### INTRODUCTION

Nowadays, information and communication technology (ICT) affects the health system development across many developing countries, particularly through the application of mobile communications (Nisha, Iqbal, Rifat, & Idrish, 2016). Mobile health is an extension of electronic health in which health care services can be accessed through smart mobile devices (Anshari & Almunawar, 2015), while guaranteeing the mobility of patients for their free activity (Lee, 2016). Mobility is the indispensable part of life today (Gürsel, 2016). Due to the attractive features (e.g., cost-effective sensors and wireless communication capabilities), mobile devices have received great attention in the health care context (Sood, Gururajan, Hafeez-Baig, & Wickramasinghe, 2017).

The potential for mobile health to transform formal health care provision, especially in the geographically remote areas, is huge (Hampshire et al., 2015) regarding many aspects of human's life (Dias, Ribeiro, & Furtado, 2016). The mobile health field focuses on the utilization of mobile health technol-

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ogy to support hospital care, healthy behavior, patient monitoring, and educational awareness (Househ, Borycki, Kushniruk, & Alofaysan, 2012). Mobile health technology can alert the patients and health care providers about health-related information and emergencies through text messaging on mobile devices (Ikhu-Omoregbe & Azeta, 2012). Telemedicine is the provision of diagnosis and health care from a distance using media, such as interactive computer programs and information technology (Kasemsap, 2017a). Mobile phone-based telemedicine has proven to be an effective approach for information exchange and for providing feedback between patients and their health care providers (Goyal et al., 2016).

EHR is defined as an electronic record of health-related information on an individual that conforms to the nationally recognized interoperability standards and can be created, managed, and consulted by authorized clinicians and staff across health care organizations (Kamath & Donahoe-Anshus, 2012). Health information technology (HIT) is the area of IT involving the design, development, creation, utilization, and maintenance of information systems for the health care industry (Kasemsap, 2017b). EHR is the part of the larger national initiative focusing on HIT, which is the exchange of health information in an electronic environment (D'Abundo, 2013). EHR systems are very important in health care settings and have the potential to transform the health care system from a mostly paper-based industry to the one that utilizes the clinical data and other pieces of information to assist health care providers in delivering the higher quality of care to their patients (Kasemsap, 2017c).

EHR is considered as the significant method of improving the efficiency of health care system (Gibson & Abrams, 2010). EHR includes health information, such as observations, laboratory tests, diagnostic imaging reports, treatments, therapies, drugs administered, and allergies (de la Torre Díez, Sánchez, Coronado, & López Gálvez, 2010). EHR attracts the particular concern about the unauthorized access and disclosure of personal information contained in the records (Ries, 2011). A fundamental requirement for achieving continuity of care is recognized as the integration and interoperability of clinically oriented systems toward the realization of EHR (Kitsiou, 2009). Through EHR, patients are provided with tools to help them manage their health care, clinicians are able to access the up-to-date patient information, and governments are showing transparency to the public by reporting health information on their websites (Protti, 2008). The suitable utilization of EHR requires the realistic concept of electronic health by all the involved professions (Ceruti, Geninatti, & Siliquini, 2016).

This chapter is based on a literature review of mobile health systems and EHR. The extensive literature of mobile health systems and EHR provides a contribution to practitioners and researchers in order to maximize their impact in global health care.

## **BACKGROUND**

Health care systems experience a wide variety of challenges with the integration of mobile and ubiquitous technology (Olla & Tan, 2009). The use of mobile devices (e.g., smartphones, pagers, tablets, and Wi-Fi phones) can accelerate the admit-and-discharge process and promote the direct communication between clinicians and patients (Moghimi & Wickramasinghe, 2017). While designing mobile health systems, the focal point of research is concentrated on the design of innovative developments for improving the practice of health care and the increase in well-being with a strong focus on the functional requirements (Mayora et al., 2016).

Mobile health is the new edge on health care innovation (Silva, Rodrigues, de la Torre Díez, Lopez-Coronado, & Saleem, 2015) and is about the ability to deliver and manage the health care services

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