

Chapter 3

An Integrated Approach Towards Developing Quality Mobile Health Apps for Cancer

Angelina Kouroubali
FORTH-ICS, Greece

Lefteris Koumakis
FORTH-ICS, Greece

Haridimos Kondylakis
FORTH-ICS, Greece

Dimitrios G. Katehakis
FORTH-ICS, Greece

ABSTRACT

The ever-growing demand for acquiring, managing, and exploiting patient health-related information has led to the development of several mobile health apps to support cancer patients. This chapter analyzes the clinical and technological characteristics of mobile apps enabling cancer patients to securely record, manage, and share their information online. It discusses issues relevant to increasing patient experience and acceptance, improving adherence to treatment, and effective support of coordinated care. Outcomes of recent research projects relevant to end user digital engagement, trust, interoperability, and usability/adaptability lead to an integrated approach towards developing quality mobile health apps. Improving quality of life and wellbeing in a secure and safe manner that respects the patients' privacy seems to be the key challenge. Regulation, standardization, and interoperability together with the existence of useful, accurate, and reliable tools for active patient engagement are imperative for efficient cancer disease management.

DOI: 10.4018/978-1-5225-8021-8.ch003

INTRODUCTION

Cancer is a generic term used to describe a large group of diseases that can affect any part of the body and is a leading cause of death worldwide (World Health Organization, 2018a). Cancer incidents have increased from 12.7 million in 2008 to 14.1 million in 2012, and this trend is projected to continue, with the number of new cases expected to rise a further 75%. This will bring the number of cancer cases close to 25 million over the next two decades (International Agency for Research on Cancer, 2015). The different phases in the cancer care continuum are prevention, early detection, diagnosis, treatment, survivorship, and end-of-life care. Many cancers can be prevented by not smoking, maintaining a healthy weight, not drinking too much alcohol, eating plenty of vegetables, fruits and whole grains, vaccination against certain infectious diseases, not eating too much processed and red meat and avoiding too much sunlight exposure (Kushi et al, 2012; Parkin et al., 2011). However despite prevention measures, some cancers do occur, while advances in medicine are helping patients increase their survival rate when cancer occurs. Cancer survivors live longer, following improved access to effective screening, diagnosis, and treatments. Individuals with cancer as a chronic condition need more complex, patient-centered quality of care across the entire cancer trajectory (Hewitt et al., 2005). As cancer is perceived as a chronic, rather than an acute, disease, concepts of patient empowerment and self-management become relevant also in the oncologic field (Kushi et al., 2012).

Cancer patients have supportive care needs during and after treatment. These relate to physical, emotional, and social needs that vary over time and between treatments. Cancer patients experience symptoms related to both the disease and the treatment, such as pain and fatigue. Care and support for patients with cancer should include early recognition of signs and symptoms, support for self-care, personalized care planning, and routine use of patient-reported outcome measures (Maher, 2013). Routine reporting of patient outcomes greatly facilitates the identification of present problems and impact of treatment. Patient reported outcomes also enhance patient-clinician communication that promote shared decision-making (Kotronoulas et al., 2014; Valderas et al., 2008). Reporting of outcomes and interacting with physicians over a digital application or app has been shown to lower overall symptoms of distress, improve quality of life (QoL), and result in fewer emergency visits and improved overall survival (Basch et al., 2016; Denis et al., 2017; Ruland et al., 2013).

Mobile devices are becoming an integral part of the healthcare industry, changing how care is delivered and received. Mobile health (mHealth) is a broad concept, used to describe a range of mobile technologies, most often consumer health care technologies, such as web-based information resources, remote monitoring, and telehealth. The World Health Organization describes mHealth as technologies like mobile phones, personal digital assistances, smartphones, patient monitoring devices, mp3 players for mobile learning and mobile computing (World Health Organization, 2011).

In recent years, Internet of Things (IoT) has emerged as a new computing paradigm, in which a continuum of devices and objects are interconnected with a variety of communication solutions (e.g. Bluetooth, WiFi, ZigBee, and GSM), enabling connectivity among heterogeneous IoT devices that can help improve the living standard of citizens. It is anticipated that more than 50 billion devices, ranging from smartphones, laptops, sensors, and game consoles, will be connected to the Internet through several heterogeneous access network technologies such as radio-frequency identification (RFID) and wireless sensor networks (Yaqoob et al., 2017). Future wireless systems will include myriad smart features and applications to make 5G the most intelligent and dominant wireless technology thus far (Al-Falahy & Alani, 2017).

24 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:

www.igi-global.com/chapter/an-integrated-approach-towards-developing-quality-mobile-health-apps-for-cancer/219854?camid=4v1

This title is available in InfoSci-Books, Communications, Social Science, and Healthcare, InfoSci-Computer Science and Information Technology, InfoSci-Medical, Healthcare, and Life Sciences, Science, Engineering, and Information Technology, Advances in Healthcare Information Systems and Administration. Recommend this product to your librarian:

www.igi-global.com/e-resources/library-recommendation/?id=1

Related Content

Development of a Text-to-Speech Scanner for Visually Impaired People

Minerva Sarma, Anuska Kumar, Aditi Joshi, Suraj Kumar Nayak and Biswajeet Champaty (2018). *Design and Development of Affordable Healthcare Technologies* (pp. 218-238).

www.igi-global.com/chapter/development-of-a-text-to-speech-scanner-for-visually-impaired-people/206296?camid=4v1a

T-Scan 8 Recording Dynamics, System Features, and Clinician User Skills

Robert B. Kerstein, DMD and Robert Anselmi (2017). *Medical Imaging: Concepts, Methodologies, Tools, and Applications* (pp. 1771-1829).

www.igi-global.com/chapter/t-scan-8-recording-dynamics-system-features-and-clinician-user-skills/159786?camid=4v1a

Denosing Ultrasound Medical Images: A Block Based Hard and Soft Thresholding in Wavelet Domain

A.S.C.S. Sastry, P.V.V. Kishore, Ch. Raghava Prasad and M.V.D. Prasad (2017). *Medical Imaging: Concepts, Methodologies, Tools, and Applications* (pp. 761-775).

www.igi-global.com/chapter/denoising-ultrasound-medical-images/159739?camid=4v1a

Computer Assisted Methods for Retinal Image Classification

S. R. Nirmala and Purabi Sharma (2017). *Medical Imaging: Concepts, Methodologies, Tools, and Applications* (pp. 978-1001).

www.igi-global.com/chapter/computer-assisted-methods-for-retinal-image-classification/159748?camid=4v1a