Journal of Biomedical Informatics 56 (2015) 265–272

Contents lists available at ScienceDirect

Journal of Biomedical Informatics

journal homepage: www.elsevier.com/locate/yjbin

Methodological Review

Mobile-health: A review of current state in 2015

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ARTICLE INFO

Article history:
Received 21 July 2014
Revised 28 May 2015
Accepted 3 June 2015
Available online 11 June 2015

Keywords:
e-Health
Health telematics
Healthcare
m-Health
Mobile health
Telemedicine

ABSTRACT

Health telematics is a growing up issue that is becoming a major improvement on patient lives, especially in elderly, disabled, and chronically ill. In recent years, information and communication technologies improvements, along with mobile Internet, offering anywhere and anytime connectivity, play a key role on modern healthcare solutions. In this context, mobile health (m-Health) delivers healthcare services, overcoming geographical, temporal, and even organizational barriers. M-Health solutions address emerging problems on health services, including, the increasing number of chronic diseases related to lifestyle, high costs of existing national health services, the need to empower patients and families to self-care and handle their own healthcare, and the need to provide direct access to health services, regardless of time and place. Then, this paper presents a comprehensive review of the state of the art on m-Health services and applications. It surveys the most significant research work and presents a deep analysis of the top and novel m-Health services and applications proposed by industry. A discussion considering the European Union and United States approaches addressing the m-Health paradigm and directives already published is also considered. Open and challenging issues on emerging m-Health solutions are proposed for further works.

1. Introduction

The introduction of mobile device (PDAs) in the 90s enabled physicians to easily download medical records, lab results, medical images, and drug information. Patients could be aware of their diagnostic, disease control, and monitoring with comfortable mobile devices that accompany them everywhere. According to [1], from 2010 to 2016 the global telemedicine market is expected to grow up to nearly 27.3 billion dollars. A key factor that contributes to this market investment is the increased remote monitoring of patients. Basically, telemedicine considers the use of medical information, also known as Electronic Health Records (EHRs) [2], exchanged via electronic communications improving the patients health status. In United States, the use of EHR technology is already widely adopted. It is estimated that 55% of medical professionals are using EHR platforms [3].

With the advent of mobile communications using smart mobile devices that support 3G and 4G mobile networks for data transport, mobile computing has been the main attraction of research and business communities. It offers numerous opportunities to create efficient mobile health (m-Health) solutions. M-Health is the new edge on healthcare innovation. It proposes to deliver healthcare anytime and anywhere, surpassing geographical, temporal, and even organizational barriers [4,5]. M-Health systems and its corresponding mobility functionalities have a strong impact on typical healthcare monitoring and alerting systems, clinical and administrative data collection, record maintenance, healthcare delivery programs, medical information awareness, detection and prevention systems, drug-counterfeiting, and theft [6]. Typical m-Health services architectures (presented in Fig. 1) use the Internet and Web services to provide an authentic pervasive interaction among doctors and patients. A physician or a patient can easily access the same medical record anytime and anywhere through his/her personal computer, tablet, or smartphone. The patient can contact the physician in case of an emergency, or even,

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http://dx.doi.org/10.1016/j.jbi.2015.06.003
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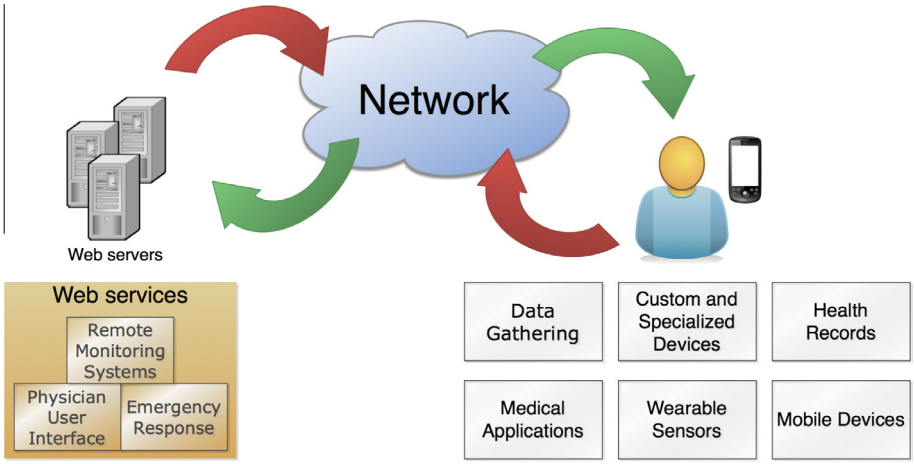

Fig. 1. Illustration of a typical architecture of m-Health services.

have access to medical registers or appointments regardless of time and place.

This paper presents a comprehensive review of the state of the art on m-Health services and applications. It surveys the most significant research work and presents a deep analysis of the top and novel m-Health services and applications available in mobile markets and healthcare industry.

The main contributions of this paper are the following:

- An extensive review of the state of the art on m-Health;
- A study of the developments/break-through on m-Health;
- An analysis of the top mobile health applications in mobile markets;
- A discussion about current and open issues on m-Health services and technologies.

The reminder of this paper is organized as follows. Section 2 elaborates on the current state of the art on e-Health systems and how health institutions and agents are embracing the information and communication technologies. Section 3 focuses on m-Health awareness and the use of m-Health services and applications. A discussion about current and open issues on m-Health technologies is presented in Section 4. Finally, the paper is concluded on Section 5.

2. Healthcare and e-Health systems: The road so far

Health telematics had becoming a great topic in terms of medical informatics and healthcare. Currently, hospitals and health systems are relying on information and communication technology (ICT) as a mean for improving quality, safety, and productivity of health care services. E-Health connects medical informatics, public health, and business through associated technologies, such as the Internet. However, it has been suffered from a slow start due to the low priority given by Hospitals and health systems to ICT in the 90s. Nonetheless, the need to produce a standard for hospital information systems was crucial. In 1987, the International Health Level Seven (HL7) organization [7] was founded and, in 1994, it was accredited by the American National Standards Institute (ANSI). Its name is a reference to the seventh layer of the ISO Open Systems Interconnection (OSI) Reference model also known as the application layer. Currently, the HL7 is adopted by ISO as a reference in terms of international standardization, publishing together several frameworks and related standards for exchange, integration, sharing, and retrieval of electronic health records (EHRs). In the beginning of the new century, between 1999 and 2002, e-Health services have finally awakened and rapidly increased. This growing was analog to the rapid evolution of ICT infrastructures and access to patient data. The Web 2.0 concept and the emerging Web 3.0 have offered to healthcare professionals conditions that never had been given before [8]. They also enabled a key element in healthcare systems, the emergence of EHRs or Personal Health Records (PHRs). Usually, healthcare providers keep and handle patient health records. However, it is becoming more common that patients also request access to those data. Medical records (or health records) allow medical doctors to easily access a patient information without needing to ask them in person. E-health systems are typically sustained on EHRs [9]. An EHR-system is basically a repository of information regarding the health records of patient/consumer in a computer form [10]. The deployment of a public EHR-system can offer several advantages to a public healthcare system, for example, lower and more efficient management costs, more efficient management of high-volume patient data, and centralized medical patient records [11].

In January 1st of 2015, the Centers for Medicare & Medicaid Services (CMS) from the U.S. Department of Health and Human Services (HHS), approved incentive payments for primary care that includes chronic care management (CCM) services. Such services, requires structured data recording using certified EHR technology [12]. These certified EHR technology must follow the regulations of the EHR incentive programs. These programs provide incentive payments to eligible professionals, hospitals, and critical access hospitals (CAHs), but only if they implement, upgrade and use certified EHR technology. This technology must be certified by the Office of the National Coordinator for Health Information Technology (ONC) under the Office of the Secretary for the U.S. Department of HHS [13]. These incentives, are a clear statement of intention, for a widely appliance of EHR services, exploring their advantages of reduced costs and improved the healthcare professionals productivity.

A large number of telemedicine and e-Health systems are being widely and successfully produced delivering health care through different communication technologies. In 2011, the World Health Organization (WHO) has identified a compendium of emerging health technologies, under development and already commercialized [14]. This report presents several health technologies that present the potential for being low-recourse solutions for unmet medical needs. Currently, the commercialized and most relevant

e-Health technologies include a fetal heart rate monitoring, portable hemoglobin meter, self-powered pulse oximeter, medical data communication system, mobile technology to connect patients to remote doctors [15], and treatment response software application [14]. Considering the technologies under development, the authors identified, to the best of their knowledge, the most relevant ones.

Fetal heart rate monitor using a mobile phone [16]: A mobile application that analyses the fetal heartbeat and calculates the heart rate using a beat-to-beat accuracy algorithm. These data are sent and stored in a server, then a midwife can examine it through a Web browser.

Mobile health record system for pediatric HIV [17]: A Web based EHR system that uses an embedded comprehensive pediatric HIV knowledge base and clinical decision system. This system allows physicians to integrate clinical information to manage pediatric HIV at the point of care.

Mobile phone image transmission for diagnosis [18]: A mobile phone with camera functionalities as image transmission unit. This system allows a basic connection to more specialized health care facilities in remote areas in the field of medical image diagnostics. The images are sent as Multimedia Message system (MMS) via mobile phones.Mobile phone pulse oximeter [19]: A mobile phone combined with a pulse oximeter sensor analyses and displays the information received from a sensor placed on a finger. It can aid physicians to detect clinical events and taking decisions.Portable telemedicine unit [20]: A portable telemedicine unit that combines a mobile telemedicine system with a computer server. Both can communicate among them via GSM, CDMA, Internet, and satellite. This device addresses healthcare services in rural or remote regions and can be used for several health services, such as recording and reporting, and tele-consultation.

Hossain et al. [21] presented in 2012, advancements and developments of multimedia services and technologies for e-Health, such as, health monitoring, ubiquitous solutions for healthcare, serious games for health, real-time access of medical services, medical assisted systems for elderly people, and medical data over wireless body sensor networks (WBSN). For these topics the authors present the following studies and proposals. Two proposals considering the serious game paradigm are presented. The first, introduced by Chan et al. [22], is based on a serious game approach for learning ultrasound-guided needle placement skills. The ultrasound-guided needle placement techniques are often used for several radiological intervention procedures. The second serious game proposal, by Maamar et al. [23], discusses collaborative exergaming applications for child obesity epidemic. The authors present a new paradigm for mobile collaborative exergaming applications that are based on peer-to-peer (P2P) architectures. The main goal is that children can exercise as a team through the mobile application with more quality of 3-D streaming with low delays. Concerning bioelectric signal technology (e.g., electrocardiogram – ECG and electromyogram – EMG), Yang et al. [24] presents a hybrid solution of a biopatch for e-Health using low-power system-on-chip (SoC) sensor and paper-based inkjet printing technology. Regarding patient monitoring and localization technologies, an RFID-based system is presented by Shirehjini et al. [25]. This system aims to track the location of a mobile hospital equipment, minimizing positioning and orientation errors. Therefore, it improves the quality of care and reducing costs. Cognitive stimulation therapy through digital TV was also considered. A design, implementation, and validation of a cognitive stimulation system over interactive TV is presented in [26]. This service improves and provides better healthcare services to patients with cognitive disorders, such as, Alzheimer or mild cognitive impairment. Regarding the elderly people that constantly need support end health services, Hossain and Ahmed proposed a support system for caregivers in a assisted living environment [27]. This context-aware system, called ViCare, interprets the elderly activities based on data captured by several sensors placed in their environment and decides what health or other services should be provided. Zhang et al. [28] proposed a solution for WBSNs to preserve integrity, safety, and privacy of medical data over the network. The authors present a key agreement scheme in which neighbor nodes of wireless body sensor networks (WBSNs) share a common key generated by ECG signals. Efficient management of medical multimedia data from various heterogeneous sources is addressed in [29]. Furthermore, a prototype for knowledge editing service (KES) is presented in [30]. This solution enables clinicians through an ICT platform to insert new knowledge for multisource data management in remote health monitoring. In [31], a cross layer design for a Wi-Max in order to deliver ultrasound video data through mobile devices is presented. Finally, a virtual reality-based surgical simulator for the mandibular angle reduction on a CUD-based platform is presented in [32]. This simulator provides stimulus and sensations for surgeons controlling instruments under different surgical situations and environments. These recent advances on e-Health services provide and improve patient care. However, the use of ICT solutions in healthcare services creates new potential health hazards [33].

A long road is still a head in many countries that continue adopting typical and old healthcare models based on the early 20th century. Nevertheless, the proportion of hospital income that is invested in ICT has doubled in recent years. Since the 1980s, investments in healthcare technologies and its growth have been a key factor, among others, for increasing healthcare spending among countries [34]. Currently, this spending growth is declining and technology is becoming an important factor to decrease healthcare costs. However, a new paradigm rises. Both patients and healthcare professionals are everyday embracing mobile technologies and mobile healthcare services. These services are having a great impact on healthcare industry and truly revolutionizing the healthcare delivery [35].

3. M-Health: The healthcare revolution

Laxminarayan and Istepanian [36] defined mobile health for the first time in the year 2000 as unwired e-med. In 2003, the term m-Health was defined as emerging mobile communications and network technologies for healthcare systems [37]. In 2006, Laxminarayan et al. present a comprehensive study about the impact of mobility on the existing e-Health commercial telemedical systems. In this work, the authors presented the new trends for m-health systems evaluating the impact of the synergies between the 2.5G and 3G systems converging to the 4G mobile platforms. Moreover, this work exploits the security aspects and issues for m-health solutions. In his early work, Laxminarayan, presented a simplified description and prediction of the advent of mobile technologies and their impact on healthcare services. Furthermore, this work served as a basis for future m-Health technologies and services. Most of them were, in fact, developed and presented in the late study of 2006 [38].

3.1. Mobile health awareness

In January 9, 2007, Steve Jobs, the CEO of Apple Inc. [39], presented to the world the iPhone 2G and its operating system (OS), the iOS [40]. This event triggered a rapidly evolution of smartphones and applications and also the emergence of new mobile platforms. Fig. 2 presents the worldwide smartphone sales to end-users by operating systems in 2013.

Clearly, Google Android and Apple iOS dominate the OS market. The quality of both operating systems is unquestionable and both

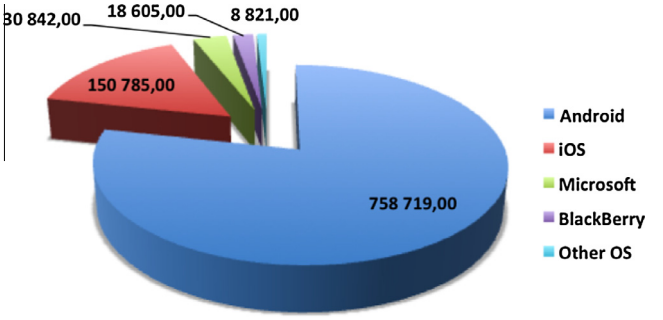

Fig. 2. Worldwide smartphone sales to end users by operating systems in 2013 (Source: Gartner [41], 2013).

companies success in the mobile applications market is sustained by their online application markets (the Apps store). These online markets are open to developers allowing them to develop all kind off applications to sell or offer them for free. These markets open new and potential areas of research and development, such as, m-Health applications. At the end of 2010, more than 200 million m-Health applications were downloaded and about 70% of worldwide citizens were interested to access to, at least, one m-Health application. Overall, smartphone Web browsers were improved becoming easier to find free applications and information [42]. It is predicted that, in 2017, more than 1.7 billion people will have downloaded health Apps with m-Health market revenue of a total of 26 billion dollars [43]. The market of mobile health applications is directed toward patients, clinicians, and healthcare professionals. These applications are mainly suited for diseases management, self-monitoring, and drug control as well as other clinical and educational applications. This raises several important and complex questions about these medical applications, such as, security, reliability, efficiency, and quality of service. Then, the following question should be raised: can they really perform a complete, secure, reliable, and efficient diagnosis? There are concerns related with this issue because several m-Health applications states claims, such as, this app will lower your blood pressure" or this app will help you to lose weight". Are these claims trustworthy? To protect users, the U.S. Food and Drug Administration (FDA), from the Department of Health & Human Services [44], enforces regulations on medical device approval and clearance. An important question that must be approved is the definition of medical device. Can a device plus a health-related application results in a medical device? If yes, it seems that smartphones can be considered medical devices because physicians already use them for numerous health purposes. Can they be classified as medical devices? To simplify the answer and the classification process, FDA proposed to amend its regulations governing classification and reclassification of medical devices to conform to provisions in the FDA Safety and Innovation Act (FDASIA) [45]. On February 2015, FDA released a new guidance for mobile medical apps. This update resulted in an rapidly increase of the development of health and medical apps. FDA states: "When the intended use of a mobile app is for the diagnosis of disease or other conditions, or the cure, mitigation, treatment, or prevention of disease, or is intended to affect the structure or any function of the body of man, the mobile app is a device." [46].

The FDA regulations on devices are very clear. Analogously, the European Commission (EC) Medical Devices Directive (MDD) covers the regulatory requirements of the European Union for Medical Devices [47]. The MDD clears and places medical devices into one of four classes (I, IIa, IIb and III). These classes concern the device increasing risk to the patient according to their characteristics, functions, and intended purposes. The MDD includes 23 articles, 12 annexes, 18 classification rules, and it is considerably more complex to read and understand than the FDA regulation. For example, in 2010, an Ericsson m-Health framework [48] was certified in accordance to a Medical Device of Class IIa.

3.2. Mobile health applications and services

The study and development of M-Health services and applications have been an important point of attention by the research community. Several research topics related to health have gathered important findings and contributions from m-Health, such as, cardiology [11,49–51], diabetes [52–54], obesity [55–57], smoking cessation [58,59], and elderly care and chronic diseases [60,61]. These different medical specialties make use of m-Health essentially for monitoring, prevention, and detection of diseases, and in more advanced services present basic diagnosis. Besides all medical applications, m-Health services are even becoming popular in developing countries [62,63] where healthcare facilities are frequently remote and inaccessible. Mobile applications for healthcare systems are rapidly growing and evolving. Research interest in this topic is expanding every day, as well as the diversification of the impact areas. Fiordelli et al. [64] present a comprehensive view of the impact of mobile phones on health, in the last decade. The authors conducted a literature review of 117 articles published between 2002 and 2012, in 77 different journals. The results shown that between 2007 and 2008, the number of research articles almost doubled, exponentially growing every year.According to [65], only in the U.S. Apple iTunes store, there are available over 40.000 healthcare apps. Furthermore, this study presents the top healthcare apps categorized by therapy area and demographically: prevention/healthy lifestyles; finding a healthcare professional/facility; diagnosis/education; filling prescription; compliance; diabetes; mental health & behavioral disorders; musculoskeletal system and connective tissue; oncology; nervous system; womens health; childrens health. The IMS Health Appscore [65] was used to define which are the best applications based on functionality, patient reviews, and their potential to lower the cost of care services an. The top m-Health applications in each therapy areas are presented in Table 1.

4. Discussion and open issues

The advent of mobile technology and applications are transforming the way health information is accessed, delivered, and managed. Cloud computing is providing numerous benefits to healthcare industry distributing and accelerating deliverance of healthcare services. Healthcare industry's adherence to cloud computing is inevitable and it is already happening [102]. The fourth-generation (4G) mobile communications system is the main responsible for enabling these advents. 4G technologies and networks empower new services and consumer usage models, reflected in corresponding m-Health services and applications [103]. These authors believe the future of this topic will pass by the transposition of services and applications based on the individual to services that involved groups and social networks. Nowadays, social networks are playing an important role on the people daily lives. M-Health solutions may enable social networking to promote healthy behaviors and awareness among patients involved in network groups and communities. Based on the above review of the state-of-the-art and market research on m-Health services and applications, mobile and ubiquitous paradigms raises important open issues. Cooperation between m-Health applications is a challenge that needs a more comprehensive study. Either patients or physicians that use the same or different services should cooperate in order to accomplish common objectives.

Table 1
Top m-Health applications by therapy area in 2013.

M-Health applications	Area	Description
Calorie Counter and Diet Tracker [66]	Prevention/Healthy Lifestyles	Diet application for calories counting, food tracking, exercise, and weight goals. Furthermore, it explores social aspects including links to friends as a motivation feature.
Calorie Counter PRO [67]	Prevention/Healthy Lifestyles	Diet application for calorie counting, food tracking, and exercise using weight goals as a motivation aspect.
Chest Trainer [68]	Prevention/Healthy Lifestyles	Weight training and fitness application that intents and claims to replace a personal trainer.
Healow [69]	Finding a healthcare professional/facility	An application that allows patients communicating with their physicians office and also have access up-to-date health records. Furthermore, it also includes visit summaries and appointment reminders.
Vitals-Your top 10 doctors [70]	Finding a healthcare professional/facility	This application provides a lists of local doctors rated by previous patients that also use this App. The search can be performed through symptom, condition, or medical specialty.
ZocDoc - Doctor Appointments Online! [71]	Finding a healthcare professional/facility	An application that uses zip code searches to find and book doctors appointments.
HealthTap - free doctor answers to medical and health questions [72]	Diagnosis/Education	An application that contains health answers and healthy tips on any symptom, condition, medication, health concern, or even wellness topics from 47,000 U.S. medical doctors.
iTriage [73]	Diagnosis/Education	An application that contains information of several medical symptoms, diseases, conditions, procedures, medications, and drugs.
WebMD for iPad [74]	Diagnosis/Education	An application that contains information of several medical symptoms, diseases, conditions, procedures, medications, and drugs. It includes WebMDs Symptom Checker.
GoodRx [75]	Filling Prescription	This application compares and provides prices for prescription drugs. Furthermore, it also provides coupons and savings tips for more than 6,000 drugs in several pharmacies in the U.S.
MyRefill Rx [76]	Filling Prescription	This application allows to order medications and get them delivered to a defined location. Moreover, it includes also medication and appointment reminders.
Walgreens [77]	Filling Prescription	An application that features medication prescriptions refill by Scan function, points for refills, pill reminders, transfer prescription feature and health references encyclopedia.
Dosecast [78]	Compliance	A medication reminder featuring a large drug database and the ability to support multiple users.
Pill Monitor Free Medication Reminders and Logs [79]	Compliance	A prescription reminder that features prescription alarms, reminder scheduling, setup reminders, and medication intake tracking.
RxmindMe Prescription/Medicine Reminder and Pill Tracker [80]	Compliance	A prescription reminder that features prescription alarms, reminder scheduling, setup reminders, and medication intake tracking.
Daily Carb - Carbohydrate, Glucose, Medication, Blood Pressure and Exercise Tracker [81]	Diabetes	An application that tracks daily nutrition intake of food, carbs, fiber, fat, tracks quantity of water intake, readings of glucose, HbA1c, blood pressure, heart rate, weight, exercise, medications, and insulin.
Glucose Buddy - Diabetes Logbook Manager w/ syncing, Blood Pressure, Weight Tracking [82]	Diabetes	This application allows users to manually input glucose numbers, carbohydrate consumption, insulin dosages, and among other activities.
GoMeals [83]	Diabetes	This application is designed to aid the user in healthy lifestyle choices featuring food, activity, and glucose tracker.
ADHD Angel [84]	Mental health & behavioral disorders	An application that features reminders for medication intake, an updated health reports for physician visits, and advice on the 8 main ADHD 'Tipping Points'.
Live OCD Free [85]	Mental health & behavioral disorders	This application claims to reduce obsessive''compulsive disorder (OCD) symptoms by 34% in 8 weeks. It features video tutorials and extensive user guide.
T2 Mood Tracker [86]	Mental health & behavioral disorders	This application uses six pre-loaded mood scales (anxiety, stress, depression, brain injury, post-traumatic stress, general wellbeing) or custom scales to monitor and track a user mood.
Office-Fit [87]	Musculoskeletal system and connective tissue	An application that contains and offers several exercises against work-related pains and stress.
WebMD Pain Coach [88]	Musculoskeletal system and connective tissue	This application provides a complete approach to balancing lifestyle with chronic pain conditions, such as, back pain, neck pain, nerve pain, fibromyalgia, migraine, osteoarthritis, and rheumatoid arthritis.
Zimmer Arthritis 411 [89]	Musculoskeletal system and connective tissue	An application for people who suffer from osteoarthritis. It is an education tool that can be used at home to learn more about arthritis pain and treatment options.
Dr. K's Breast Checker [90]	Oncology	An application designed to aid women keep track of change in breasts. Furthermore, it provides education information and reminders.
PCR Tracker [91]	Oncology	An application for Chronic myeloid leukemia (CML) patients that includes lab tests results tracking, treatment reminders, understand treatment milestones, and also features educational tools and videos.
SkinKeeper [92]	Oncology	This application allows users to monitor moles, capture important personal, and family skin cancer risk factors. Moreover, it allows a patient to share this information with their doctor.
Noteness (Multiple Sclerosis) [93]	Nervous system	A multiple sclerosis diary application that allows a user to track and monitor injections and symptoms.
Parkinson Diary [94]	Nervous system	An application for Parkinson patients and caregivers to record, reports, and reviews Parkinson symptoms.
Young Epilepsy [95]	Nervous system	An application for young people with epilepsy and also for their parents or carers. Contains a education portal, video, and a diary.
Ovulation Calendar Ladytimer Free [96]	Womens health	An application to track and predict menstrual cycle days. It aids women to become pregnant or avoid pregnancy.
Period Diary (Period, Fertile & Ovulation Tracker) [97]	Womens health	An application that monitors menstrual symptoms, body weight, temperature through a fully animated period, and ovulation tracker.
Pregnancy Tracker [98]	Womens health	An application to aid women through pregnancy day-by-day. The women has access to personalized content and the latest parenting news and health information.
Baby Connect (Activity Logger) [99]	Childrens health	A baby tracking application featuring graphical reports and trending charts, weekly

(*continued on next page*)

Table 1 (*continued*)

M-Health applications	Area	Description
		averages, medicine, vaccine and growth tracking, timers, notifications, reminder alarms.
Baby Food Pee Poo Free [100]	Childrens health	An application that features a baby logger/tracker, reminders (feeding, diaper change, and sleep), and a white noise recorder/player.
Total Baby [101]	Childrens health	A complete baby tracking application that covers: Diapers, Nursing, Pumping, Bottles, Solids, Sleeping, Bath, and Other (timing and tracking), Diary, Milestones, Doctor Visits, Growth, Vaccines, and Allergies (logging).

Cooperation methods also aim a better efficiency and performance of mobile devices (for example, device battery, storage, and network). In an m-Health typical system architecture, sensitive health data is exchanged through wireless networks. Then, data privacy and security is a major issue on information management for public health needs. A study related with the impact of mobile communication technologies for health on patients and health professionals must be performed. This study should include questionnaires to collect data related to the influence of m-Health applications on end-users/patients daily routine. A study on how m-Health applications can reduce financial costs to end-users/patients and how the healthcare public and private systems are affected by m-Health.

5. Conclusion

M-Health services and applications propose healthcare delivery anytime and anywhere overcoming geographical, temporal, and even organizational barriers with low and affordable costs. This study reviewed the state-of-the-art on m-Health services and technologies. Furthermore, it presented the m-Health technologies growth, its regulation, and legislation issues. Based on this compressive review, the authors believe that m-Health services and applications has already a very important and determinant role in restructuring the old healthcare services and systems that still based on the physical relationship between patient and physician. Moreover, m-Health applications have a strong impact on all healthcare services, such as, hospitals, care centers, and emergency attendance. Therefore, it aims to be a major improvement on patient lives, especially in elderly, disabled, and chronically ills.

6. Conflict of interest

The authors declare that there are no Conflict of Interests on the current paper.

Acknowledgments

This work has been partially supported by *Instituto de Telecomunicações*, Next Generation Networks and Applications Group (NetGNA), Covilhã Delegation, by the National plan of Science, Technology and Innovation (MAARIFAH), King Abdulaziz City for Science and Technology, Kingdom of Saudi Arabia, Award Number (12-INF2817-02), by National Funding from the FCT – *Fundação para a Ciência e a Tecnologia* through the UID/EEA/50008/2013 Project, and by the AAL4ALL (Ambient Assisted Living for All), project co-financed by the European Community Fund (FEDER) through COMPETE – *Programa Operacional Factores de Competitividade*.

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