

Use of mobile technology in healthcare

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Abstract

Introduction: It has been shown that ICT (Information Communication Technology) has the potential to provide better healthcare services. In the last decade, mobile technology has become very sophisticated and widely spread among people. It provides a new set of tools to improve the health professional-patient relationship. There have been developed many mobile applications that may be potentially useful for healthcare purposes. The literature review is aimed to present the role of mobile technology in healthcare. *Methods:* A descriptive research method with a critical review of English scientific and professional literature was performed, using Science Direct, CINAHL with Full Text, MEDLINE, and Google scholar. The keywords with the use of Boolean operators AND/OR were: smartphones, mobile technology, and healthcare. Literature inclusion criteria were articles published between 2014 and 2019, freely accessible and primarily reviewed articles with clearly defined objectives and methods in the English language. We reviewed 15 articles, the excluded ones did not match our inclusion criteria. The literature search took place in February and March 2020. Data were analyzed using the content analysis method. *Results:* The results showed that mobile technology can benefit patients as well as healthcare professionals. Patients can use them as devices that help to perform daily tasks for a healthier life or easier management of chronic diseases. Mobile technology can empower the patients, so they can take control of their health condition. Healthcare professionals can use it for additional or different learning options or as a tool in patient-centered care. The use of mobile technology can influence communication and relationship between patients and healthcare professionals, also, it breaks down barriers, such as language and long-distance. Adopting mobile health technology perceived an overall positive impact among patients, indicating they are ready to transition from traditional clinical

encounters to modern treatment ways. Nevertheless, caution and professional perspective based on knowledge and ethical considerations are needed when implementing new technology in healthcare. *Discussion and conclusions:* The use of mobile technology and mobile health interventions has increased significantly. Even though mobile phone-based interventions have the potential to improve treatment outcomes, there are still challenges relating to new technologies that must be taken into consideration. To be able to understand how different factors affect the development process from a technical and human perspective there is a need for evaluation of mobile technology. It is necessary to conduct more studies with greater variety in research design and users on mobile applications to evaluate their effectiveness.

Keywords: smartphones, mobile technology, ICT, healthcare

Introduction

Within the last two decades, we have witnessed remarkable technological development of information and communication technologies and their implementation into healthcare (Cannon, 2018). Technological progress has resulted in several movements: a need to address the rising burden of chronic diseases, an exponential increase in developing smaller and cheaper devices, and developing a patient-centered healthcare model. Miniaturization of diagnostic instruments have led to promises to improve patient care, individual well-being, healthcare outcomes, encourage healthy behaviors, reduce healthcare costs and provide widely accessible services (Philips and Merrill, 2015; Bhavnani et al., 2016; Aceto et al., 2018).

Mobile health (mHealth) is defined by the practice of medicine that is supported by portable diagnostic services. While technological development offers many benefits, it also raises many ethically relevant questions, regarding widespread device use and their safety (Bhavnani et al., 2016; Lucivero and Jongsma, 2018).

This literature review aims to present the role of mobile technology in healthcare.

Methods

A descriptive research method with a critical review of English scientific and professional literature was performed, using Science Direct, CINAHL with Full Text, MEDLINE, and Google scholar. The keywords with the use of Bool's operators AND/OR were: smartphones, mobile technology, and healthcare. Literature inclusion criteria were articles published between 2014 and 2019, freely accessible and primarily reviewed articles with clearly defined objectives and methods in English language. We reviewed 15 articles, the excluded ones did not match our inclusion criteria. The literature search

took place in February and March 2020. Data were analyzed using the content analysis method.

Results

Through applying our inclusion criteria we were able to find five articles on the use of mobile technology in healthcare. All of the studies are based on a literature review (table 1).

Table 1: Overview of the review studies

<i>Authors and year of publication</i>	<i>Purpose of research</i>	<i>Methodology</i>	<i>Results</i>
Quadah and Leutsch, 2019	To explore the influence of mHealth applications	A systematic, narrative review of literature	mHealth provides bidirectional communication, regular contact, and continuous care. It enables placing the patient at the center of discussion.
Grekin et al., 2019	To consider mHealth interventions	Literature review and viewpoint	mHealth reduces barriers, associated with cost, transportation, and treatment-related stigma.
Hallberg et al., 2020	To describe the development and evaluation of mHealth	Literature review	Evaluation on how various factors affect the development process from both a technical and human perspective is important.
Nouri et al., 2018	To assess the quality of mHealth apps	Literature review	Assessment criteria for devices evaluation: design, information/content, usability, functionality, ethical issues, security and privacy and user-perceived value.
Lucivero and Jongsma, 2018	To overview bioethical issues raised by mHealth	Literature review	Developers of the devices need to ensure that they will be used only for the intended purpose, in certain contexts.
Birkhoff and Smeltzer, 2017	To describe the experiences of mHealth applications among chronic disease populations	Integrative review of the literature	User-centered mHealth provides individualized support to chronic illness populations.

Discussion

The problem of the doctor-patient relationship in the form of depersonalization arises due to the absence of face-to-face interaction, nonverbal communication, and the opportunity to observe the patient (Quadah and Leutsch, 2019). Patients are burdened with professional tasks they are not qualified for (Lucivero and Jongsma, 2015; Cvirkel, 2018).

Mobile technology has the potential to provide services to areas and people that are difficult to reach. Those kinds of services may not reach the ones

who are most in need of care, due to lack of mobile phones, internet connection, low-income, and elderly people (Chib et al., 2014; Lucivero and Jongsma, 2015).

New revolutionary devices need to be assessed carefully concerning their plausibility (Lucivero and Jongsma, 2015). There are still many uncertainties, including the selection of appropriate devices, privacy and security issues, the lack of evaluation standards, limited quality control, and the pressure to move into the mainstream of healthcare (Noouri et al., 2018). Possibilities for abuse of sensitive health information and unforeseen effects need to be explored (Lucivero and Jongsma, 2015).

Conclusions

In the next decade, we expect even greater convergence of technology and healthcare, resulting in the development of new technologies. To achieve the potential of mobile technology in healthcare, we have to identify methods for patient engagement, to develop the necessary tools to streamline clinical integration and data analytics, and to outline the regulatory factors. There is a need to evaluate which patients are suitable for device-based self-care. Mobile technology is argued to be an efficient and cost-effective solution for prevention, monitoring, and management. Technical and ethical concerns arise, which demands structured verification and evaluation of mobile technology and the clinical impact of these technologies, due to overly positive promises.

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