

Factors Influencing the Healthcare Environment: Review of Mobile Healthcare Models (M–Healthcare)

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Abstract

The mobile devices play an important and critical role in our lives, especially the great transformation of the previous platforms and the PCs. With the great transformation and expansion of the investment opportunity of the modern mobile devices, smartphones and adaptation to the service of humanity awoke a great opportunity to integrate the modern mobile devices in sanitary environments and to provide a gold service for humanity. It begins by providing a local opportunity for patient's therapy to foretell and a crucial decision making in the patient's life. Mobile health care, call (M–health care), are a new area of scientific research became a brilliant tool and constantly updated in modern medicine. mhealthcare can be used to strengthen the physical and psychological performance of patients who need continuous follow–up for immediate intervention to save the patient's life as needed. In this research, we discuss mhealthcare and the best way to use it to improve the field of mobile medicine. This paper introduced mhealthcare apps that shows an easy way for the next generation, because becoming an important part of

this technology and also highlights the merits of mhealthcare or mMedicine in healthcare environment.

Keywords: *Healthcare Milieus, Tele medicine, mHealthcare*

المستخلص

تلعب اجهزة الموبايل والاجهزة المحمولة دورا مهما وحاسماً في التحول الكبير الحاصل من المنصات السابقة وأجهزة الكمبيوتر. هذا التحول الكبير وفر فرصة ذهبية كبيرة للاستثمار في الاجهزة النقالة الحديثة وكذلك الهواتف الذكية لأغراض عديدة اهمها خدمة البشرية من خلال توفير الرعاية الصحية لهم. الفرص المتوفرة تبدأ من خلال توفير العلاج الموقعي للمرض الذين يعانون من امراض مزمنة لغرض اتخاذ قرار حاسم من قبل الاختصاصي لانقاذ حياة المريض وتوفير الرعاية الصحية المتنقلة اللازمة له وهي اداة علمية قابلة التحديث المستمر لا يصلح افضل الخدمات للمرضى في اي مكان وزمان. الرعاية الصحية المتنقلة توفر العاج الطبي والبدني والمتابعة المستمرة لحالة المرضى وتوفير العلاج اللازم والتدخل الفور اذا تطلب الامر. في هذا البحث تم مناقشة تكنولوجيا الرعاية الصحية المتنقلة ودورها الفعال في توفير افضل السبل الصحية لانقاذ مرضى الامراض المزمنة. وقد قدمت هذه الورقة البحثية تطبيقات الرعاية الصحية. ، والتي تُظهر وسيلة سهلة للجيل القادم، لأن أصبحت جزءا مهما من هذه التكنولوجيا، وسلطت الضوء أيضا على مزايا الرعاية الصحية المتنقلة أو الطب المتنقل في بيئة الرعاية الصحية.

1. Introduction

Mobile time refers to the ability to make decisions at different times and in various places. The decision means that treatment requires the use of fixed or mobile related tools. The decision involves processing events through fixed tools (such as laptops or notebooks) or mobile devices (such as mobile or iPad) [1]. Scientific and technological development has contributed significantly to the evolution of mobile technology devices,

especially mobile systems. Local and global markets have seen an unprecedented invasion in the development of smartphone technology and PDA devices and their apps . The international information network (Internet) and wireless sensor networks are becoming an important team for the technologies and technologies of mobile smartphones to quickly provide critical information to their destination [2]. These devices are more effective and easier to use the existence of Internet technology, and the agreed price for the purchase of smart phone devices has contributed effectively and significantly to the participation and therefore the increase of its technological development. All this contributed to the existence of timely information and practically changes at any time, in all areas, whether scientific, medical, educational, etc. [3].

This problem has contributed to the development of medical information and the speed of its arrival with the possibility of accessing it from anywhere, the existence of a smart mobile device allows access to the Internet. Mobile devices have many tasks and Functions that are used to connect to the Internet more easily and quickly. This service helps smartphone users to get medical information anywhere at any time. This has contributed to the emergence of many medical apps that provide sufficient information to the patient about his illness at any time with the latest updates of this information [4]. Fig. (1) Below, Health affects the value care delivery.

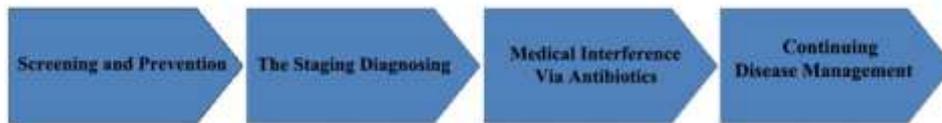


Fig. (1) Health affects the value care delivery

Health Care is a technology that makes medical access to the user and offers a healthy life for all patients. The main reason for the success of m-health technology and its spread through smart phones and mobile devices because of a large number of mobile devices and their quick access and ability to carry anywhere with ease. Despite a large number of computers available and a large number of users, mobile devices and smartphones are the most popular hand and transport uses [5]. These devices can be transported to distant and remote locations. This helps facilitate access to healthcare apps easily from the patient side as well as part of the doctor at high speed from providing mobile devices and Internet access, as well as their small size relative to large PC sizes and Trucks [6]. But that does not mean that computers are used to access medical apps . If a patient is at home or in the office, a computer and the Internet are available, the patient can access the private health application required by the patient's health to obtain sufficient information about his condition or visit his doctor after giving your identification to be defined by your doctor [7].

The latest statistics for the past five years the number of mobile devices and smartphones has significantly outpaced computers. Most people, especially patients, spend most of their time at home. According to many studies, using medical apps over mobile devices or smartphone is more than using these apps over computers or laptops, because the small size of mobile

devices or smartphones and easy to use as well as the small space occupied by these devices. [8]. the distinguishing feature of users of healthcare applications is the systematic use of smartphones or mobile devices to access their health apps in the use of other devices. Mobile technology has reduced the risk of progression to efficacy and significantly the disease due to the continued access of patients to their healthcare apps and to communicate with their doctors regularly and continuously [9].

The large development for mobile devices and containing high-resolution cameras has greatly aided their patients directly, especially when presented in video or image to a medical specialist. Therefore, mobile devices or smart phones can be effective medical platform due to the ease of access to users' mobile devices, particularly patients, and provide sufficient support to Internet technology. The use of modern methods and techniques in the field of health, helping to make apps for the health care of our patients are more interactive, available anywhere and at any time and flexible in their use [10].

M-Healthcare is a technology that uses mobile technology and wireless technology for health and online medicine. This technology has enabled clinicians and developers to create a collaborative environment that caters to patients and therapists encouraging them to provide better health to their patients [11] [12].

2. Background

This part describes the characteristics of m-health. The aim of this section is to provide details of the system of observation

areas closest to m–health patient infrastructure, specific SW architecture, part of m–health apps. [13].

2.1 Targeting followed closely (TMC)

TMC based on the monitoring of vital signs (two signals) of the patient through external sensor devices that are built on mobile devices. Usually, these external sensors often communicate the patient's body to transfer the patient directly dual medical signals immediately [14].

2.2 TMC Registration Notes

In general, most health care apps that is used to provide patient care should be easy to use. So, one of the most languages that are used to write an Android operating system is Java (J2ME platform), because of the favorite language for many programmers, designers [15].

3. Sensors on demand

The sensors are used to collect the patient's dual signals, these sensors are not enough to cover all the patients' needs and what they need. It is also important to note that the integrated sensors for mobile devices are insufficient to cover the needs of this area [16]. Note that most apps that monitor patient bi-monitored signals rely primarily on external sensors associated with mobile devices. These devices are not reliable enough to transfer important patient data to the application and in contact with your doctor [17].

4. Mobile Devices Infrastructure

Although in the field of mobile systems, science, and technology, there are many problems that hinder this progress, especially in the level of health required for patients on an

ongoing basis. One of these problems is missing from the battery of mobile devices due to repeated use in performing the application functions on these devices [18].

5. m-Health Problems

Although the health system on mobile devices is always online (connected to the Internet), so there are problems that make the work of these systems difficult. One of these problems is that the battery life is not enough for the system to work on mobile devices online. There are several scenarios used to make system continuity possible [19]:

- a. Call the system and send a short medical message about your health and patient identification.
- b. The presence of a patient near the health care area as the GPS mobile to detect the location of the patient faster.
- c. Use Bluetooth devices to send medical patient data if the Internet is not available [20].

6. M-sanitary: characteristics and advantages

Great advances in computers, mobile phones and smart devices have contributed in an effective and meaningful way to the spread of mobile healthcare. These regulations have contributed to the development of the work of physicians and therapists, on the other hand, have also contributed to the development of patients and allowed them to treat these health systems despite the ease of constant updating.

M-health care is a natural extension of e-health care [21]. The main interest of m-sanitaria shows its potential to improve the performance of patients with the disease and requires constant vigilance. The Health Care Service provides an

opportunity for patients to engage in other healthy activities on a daily basis. The main benefits of mobile technology have become widespread, accessible and easy to use. This technology offers a secure way for greater efficiency and faster recovery of patients through access to reciprocal information, facilitates and accelerates the right decision at the right time [22]. M-health care promotes interaction in two basic directions, the first is that it promotes direct and immediate contact between the patient and the doctor. This method provides a safe patient giving their secrets to their doctor about their health directly without shame. The second trend is that this technology has been used by large groups of patients, which led to a rapid dissemination of information on them quickly and well distributed. There are many benefits of m-health, can be clarified by: Portable all parts Computer all parts very flexible and easy to use, both parts able to store data, abundant necessary accessories, access content anywhere anytime, compatible With healthcare distance medicine, patients update data continuously, reduce the scientific gap between patients and physicians, providing easy-to-use medical platforms and easy to communicate with the physician and improve interaction between patients and Doctors [24]. In the fig (2) below, mobile healthcare distribution according to location and application field.

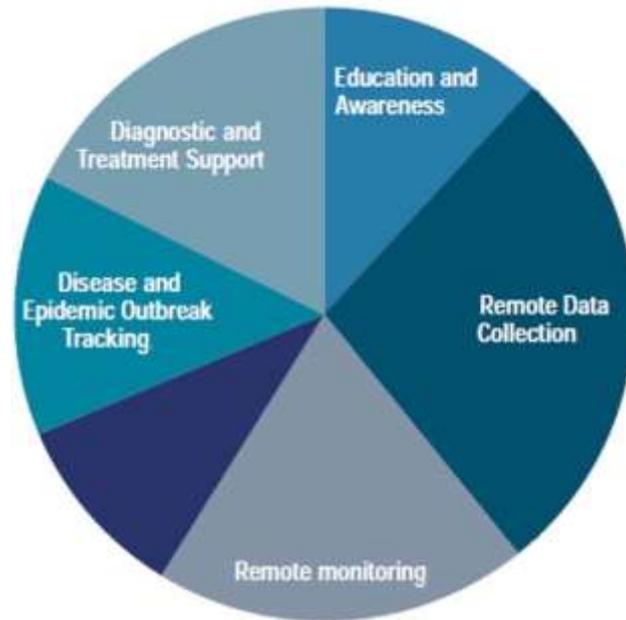


Fig (2) Mobile Healthcare Distribution According Location and Application Field

7. Wireless Sensor Networks (WSN)

In recent years, the world has a strong interest in wireless networks, especially wireless sensor networks. This interest has increased with the proliferation of electrical and mechanical devices that are in direct contact with people. WSN consists of a small, inexpensive sensor and looks like the actual conventional sensors. The main function of these sensors (nodes) is to gather information from the environment through the sensor and the signals sent by the access point to the fixed infrastructure in order to make the right decision for the responsible user. These nodes consist of [24]:

- a) Memory for storing information.
- b) Processor to implement the user's decision.
- c) The continuity of the battery in the contract should always be online.

These arches have spread to places inaccessible by humans. A computer or laptop is connected online with the contract through WSN. Each sensor provides a sensor node or more. These nodes must have low power devices equipped to operate. There are different types of sensors (thermal, biological, mechanical, etc.). These strains can be attached to the sensor node to measure the characteristics of the environment. The main power supply at the sensor nodes is the battery. The problem of these battery power grids is exhausted. This problem was solved by using solar panels to provide power to the batteries [25]. The WSN infrastructure is generally low and is remotely controlled by the use of electromagnetic radio waves. WSN are two basic types:

1. **Organized (structured) WSN:** This network provides a wide range of sensor nodes deployed in a large-scale pre-planned and remotely controlled field to perform tasks and prepare their own reports.
2. **Unorganized (unstructured) WSN:** These networks contain sensors from unorganized nodes in unorganized areas. In these networks, detection of instructions and failure is very difficult because of many unorganized nodes [26].

8. Online Medical Supervision

Hospitals help patients to introduce the best services, including the deployment of effective medical mobile apps . There are many places relevant to the patient himself. WSN will be installed in relevant sites such as intensive care rooms, the room, and the emergency room. WSN standards are IEEE 802.11b / g, and the use of mobile computing platforms is the basis of this

revolution in wireless networks. This revolution in wireless network development has helped healthcare providers become more interactive to receive real-time information on mobile devices or smart devices. These factors have clearly contributed to the fusion of wireless networks with people and are considered a necessary part of their life in several aspects, especially in the health-m-sector [27].

9. m-Healthcare: New Horizon for Telemedicine

Health care has the ability to reduce costs and improve the quality of health care that, because of the large circulation and meet the needs of patients. But there are technical and administrative obstacles to health care. The high efficiency of mobile devices, wireless networks, and technology used in moderation has contributed to the dissemination of mobile medical apps , serving telemedicine for remote monitoring of patients and to determine the appropriate site provided by the service [28].

10. Practical implication of m-health

The biggest and most important factor in the m-health service is the effectiveness of the response. In order to attract more m-health users, improve the quality of services provided in m-health in order to win successful users and increase sales. For the negative effects of the cost of the response, the designation of medical provider-m and perform a sufficient study on the markets for m-health products and, therefore, to estimate services at affordable prices meet the needs of the consumers. There are many differences between mHealthcare (mobile

healthcare) and eHealthcare (Electronic healthcare) summarized below:

Table (1) General differences between m-healthcare and ehealthcare

Mobile Healthcare		Electronic Healthcare	
1	Mobile accessibility for Everyone	1	Access restricted to physicians and specialists
2	Easy to access to desktop	2	An inverse-relationship exists there
3	More .difficult application to setup than web services	3	Easy via web service installation
4	Telecommunications people will be very significant moving forward	4	Telecommunications Significant for patients and physicians
5	More personal	5	More generic
6	A lot of the innovation and producing services for countries with fewer resources	6	Innovate in healthy care presenting as soon as possible and according to patient's condition

The community factor is an important factor influencing the expansion of consumer reach and improving the performance of the service rendered and thus a positive impact on the user's behavior. One of the important factors that positively affect the behavior of mHealth users is ease of use. This question led to the adoption of design services based on the user's service property and be sure to provide a facility for the school. In addition, benefit from the simplified training course for consumers to ensure the arrival of mobile products and enjoy m-health products. The status of a comprehensive study on threats affecting product and user (patient) health is very important because these threats negatively affect the patient's health, on the one hand, and affect product sales Health in the market and recession [29].

11. Health awareness through m-Health

M-health is the infrastructure of e-health, there is still no coherent and uniform definition of m-health. The Global eHealth

Observatory (GO eHealth) is a medical or medical practice supported by mobile devices, mobile devices, smart phones or PDAs, etc. Use mobile devices, including images that send voice and text messages to the patient. The radio service, global positioning system (GPS) and the Bluetooth service on advanced mobile devices can enjoy. Telemedicine can be described as a consultation between doctors and health on the particular medical case and give this advice online through mobile functions such as SMS messages or video or audio materials in this device. This service can be applied to all patients and in different places, whether at home or at work or even in hospitals and health centers. To implement this, there is an application on the mobile device and the Internet line. This service is not widespread in poor and developing countries for many reasons, including [30]:

- Lack of permanent form of online availability.
- Lack of human resources.
- The lack of sophisticated mobile devices easily in medical apps, depending on the architecture of the mobile.

12. Conclusion

The goal of m-Health technology provides complete protection for patients and provide the necessary assistance if requested anywhere at any time. This technology makes possible the relationship between healthcare and technology. This relationship has increased due to the widespread use of these technologies and the development of mobile devices and smart devices. M health technologies include health care for children, the elderly, even healthy people who need a medical consultation.

The background to this article focused on health care and other ways to help improve the health system, including remote rural and urban areas. This article focuses on the future challenges of mHealthcare . Online health services are not a substitute for routine health services, such as surgeries performed in ordinary hospitals. Therefore, m-sanitary provided optimal, fast, easy and integrated solutions for patients who are away from ordinary medical services such as hospitals and medical centers. Digital image compression and digital signal compression techniques can be integrated into the field of electronic health to provide a speed and a time to treat patients suffering from critical situations.

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