

Acceptance of Health Information Technologies, Acceptance of Mobile Health: A Review Article

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ABSTRACT

Background: Mobile health is one of the new technologies for the utilization of health information. For its successful implementation as well as any other system, we must primarily measure the adoption and use of its factors. The purpose of this study was to systematically investigate published articles about the factors affecting the adoption of mobile health and categorizing the factors affecting the adoption of this system.

Methods: This study is a comprehensive review done by searching major databases such as Google Scholar, Emerald, Science Direct, Iran Medex, SID, Magiran, Pub med, etc. In addition, we use Mobile, mobile Health + adoption, mobile Health + TAM, Health + TAM keywords in the range of 2004 to 2015.

Results: Among the studies that use information technology theories to survey the factors affecting the adoption of mobile health, TAM model was used more than other models. Factors such as perceived ease of use, perceived usefulness and facilitating condition form TUATU are the most effective in the adoption of mobile health.

Conclusion: Results showed that by considering factors such as perceived ease of use, perceived usefulness and facilitating condition can increase the adoption of mobile health system. Consequently, these factors are recommended to be considered in planning to run systems.

Keywords

Mobile Health, Technology Acceptance Models, Perceived Ease of use, perceived Usefulness, Facilitating Condition

Introduction

Most smart phones can support Capabilities of Third Generation (3G) which have improved the Speed and Quality of Services [1-5]. Smart phones are mobile phones combining voice calls with other functions such as Web services, text messaging, audio and video players, fixed cameras; applications for task organizing and a platform for the use of applications. These functions convert smart phones to portable computers [3,6-7]. With the help of smart phones, one can access various medical applications such as drug reference, medical reference books and other necessary digital information anywhere, anytime. Even, tele consulting and access to electronic health records in the world is possible [3-4,8]. It can be used to enhance the performance of hospital wards, improve care, optimize services, improve quality, reduce human errors and the most important point is to reduce

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Received: 27 July 2015
Accepted: 7 September 2015

hospital costs [5-6,9-11]. Human barriers are of the most important barriers to the implementation of health information technologies in addition to financial issues [12-14], and this point indicates that its adoption factors should be investigated, further, because acceptance and use of a technology by users is one of the extremely important factors for the successful implementation of health information technology [15-17,]. By increasing investment in new information and communication technologies, study of acceptance of these technologies has been considered and various researchers have tried to identify factors that affect the adoption of information technology to increase the use of these technologies [3-7,9,11,18]. Adoption measurement has an important role in the successful implementation of a system. The theories of acceptance and use of information technology are very important for predicting the reaction of end users in health information technology [8-10,17,19-22]. Nowadays, in developed countries, many studies have been conducted in the field of mobile health among the physicians and other treatment staff in different areas. From important models of technology acceptance which have been used more than other models, were the Technology Acceptance Model (TAM) and unified theory of acceptance and use of technology (UTAUT). Given the growing importance of smart phones used by the medical team and the extensive use of it in the health industry by developed countries, the aim of this research was to systematically review the performed studies about the adoption of mobile health technology and determine the most important factors affecting the use of this dynamic technology.

Methods

To access the relevant studies to the present research, precise investigation is performed in valid databases and by using relevant keywords. The relevant articles found by searching in the databases such as Google Scholar,

Science Direct, Pub med, Scopus, ISI and DOAJ. In addition, investigations performed in Important Persian databases such as Iran Medex, Mag Iran, Iran Doc and SID did not reveal any relevant data.

In the present study, to screen relevant studies, several limitations were used that article selection process is shown in Figure 1.

Also, for selecting relevant articles, we used the combination of several important keywords that were effective in the selection of final relevant articles. These keywords include: Mobile Health + Adoption, Mobile Health + Acceptance, Mobile Health + TAM, Mobile Health + UTAUT. Table 1 shows exactly the number of studies found based on the combination of each of the keywords in all database.

Table 1: Relevant Articles found based on Combination of Keywords

	1st key-word	2nd key-word	Relevant Articles found
1	Mobile Health	Adoption	161
2	Mobile Health	Acceptance	144
3	Mobile Health	TAM	48
4	Mobile Health	UTAUT	11

Results

After finding performed investigations, 622,000 articles were found from 6 below databases, which eventually 361 relevant abstracts were selected based on the subject of study the details of which are shown in Table 2.

After reviewing the searched article abstracts and by execution of the limits listed in Figure 1, Finally 9 quantitatively relevant articles, which had used technology acceptance theories as well as publishing in the period from 2004 to 2015, were selected. It should be noted that in Persian databases search was performed by using related keywords but did not find any relevant study.

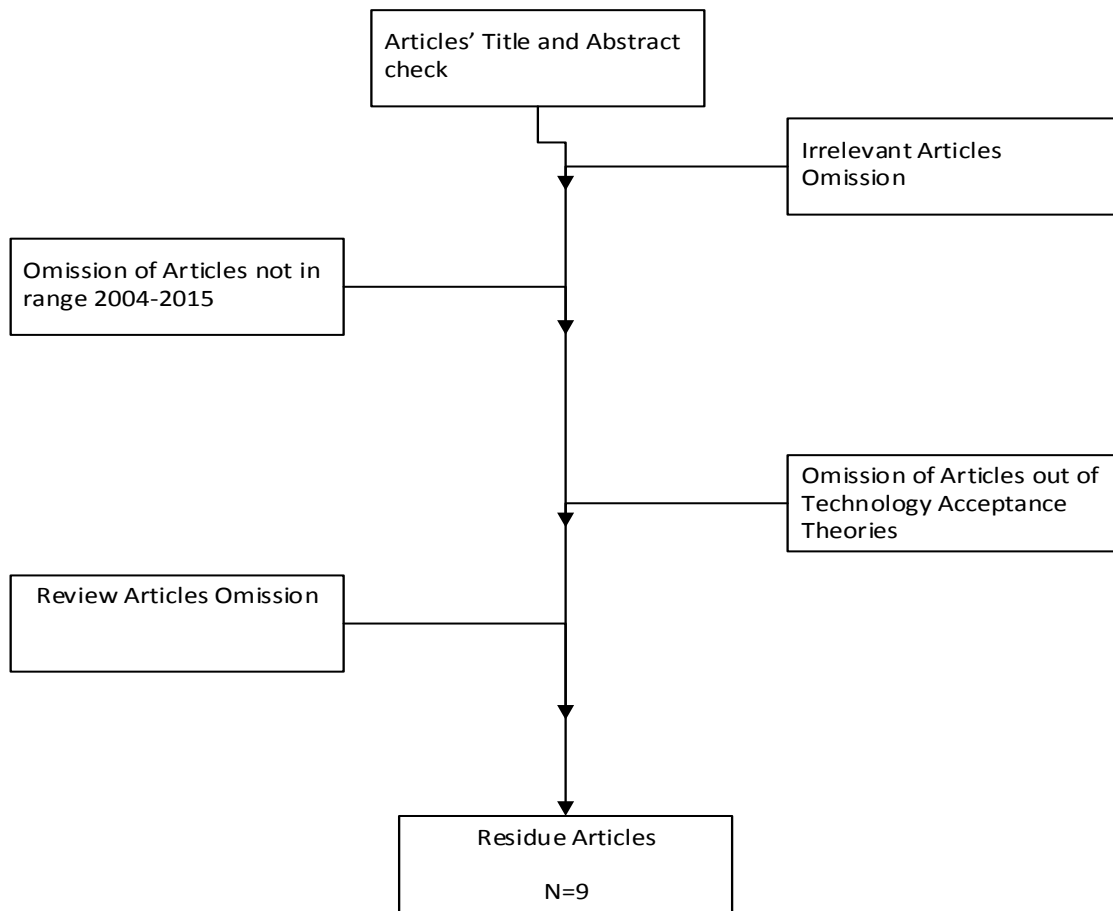


Figure 1: Literature Search Strategy

Table 2: Articles found base on the database

	Database	Number of found Articles	Relevant Articles
1	Google Scholar	609000	131
2	Science Direct	11732	78
3	Pub med	539	63
4	Scopus	478	59
5	ISI	225	23
6	DOAJ	26	7
Total Sum		-	622000
			361

In Table 1, relevant Articles have been shown based on the combination of key words.

After selecting relevant articles for study, we proceed to investigate conducted studies, based on which, among different available models in the area of technology acceptance, technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT) and in one case diffusion of innovation theory (DOI) had been used for investigating the factors affecting the adoption of mobile health.

Moreover, among factors affecting the adoption of this useful technology, perceived ease of use, perceived usefulness and facilitating conditions have the most significant impact on the adoption of mobile health technology. (Table 3)

Table 3: Models used and the most important factors influencing the adoption of mobile health

Models	Number of Articles	The most important factor
TAM	4	perceived ease of use, perceived usefulness
UTAUT	2	Facilitating conditions
DOI	1	-
Others	2	-

Discussion

The results showed that mobile health has an important role in providing health care services which has played its role in this area well. Chatterley's study showed that use of mobile health among medical students included Drug information, e-mail, medical reference, dictionaries, doing clinical calculation, differential diagnosis of diseases and saving of daily logs [23], which reflects the importance of this technology. Regarding the increasing development of this technology, many researchers have investigated the factors affecting this technology, especially with the use of technology acceptance models. In recent years, many studies have been done that show the high capability of technology acceptance model to show the amount of the Technology acceptance among physicians [24, 25]. Technology acceptance model shows eventually for the validity, confidence, power and simplicity of information technology [26]. Some researchers have investigated factors using a combination of available factors in different models. For example, Putzer and Park in 2012 used the combination of technology acceptance model (TAM) and diffusion of innovation (DOI) for mobile acceptance among physicians in their study [27]. Mekić's study in 2014 was allocated to develop technology acceptance model (TAM) in the smart phones acceptance [28]. In addition, Vassilios et al., based on tech-

nology acceptance model, provided a pattern that shows intention to use the technology up to 87 percent [29]. In the context of Acceptance of electronic medical records, Haselina and Harvard in their studies have investigated the factors affecting the adoption of electronic medical records with the composition of TAM model or various models [30-31]. Another model that has found application in recent years, is a unified theory of acceptance and use of technology (UTAUT), which was presented in 2003 and used by researchers in recent years to investigate factors affecting mobile health. This theory can show the intention to use the system up to 70 percent [32]. The results of this study indicated that technology acceptance model (TAM) had the most significant use in order to determine the factors affecting the adoption of mobile health technology. Factors used in TAM model include; perceived ease of use, perceived usefulness that among other factors have the greatest impact on the adoption of mobile health. Garavand et al. in their study concluded that the perceived ease of use and perceived usefulness are the most important factors affecting the adoption of picture archiving and communication system [33]. Tavakoli et al. and Abdekhoda et al. in their studies concluded that perceived ease of use and perceived usefulness are of the most important factors affecting the adoption of EMR [34-35]. Based on obtained results, facilitating conditions were among factors that affect the acceptance of mobile health technology more than other factors; these factors are in UTAUT model and express the conditions that make the use of technology easier. Haslina in his study pointed to the importance of facilitating conditions on the adoption of electronic medical records technology [36]. In addition, Holtz and Krein in their study gained the similar results, and pointed to the role of facilitating conditions in adoption of electronic patient records [37]. Nematollahi et al. in another study found that facilitating condition is important in intention to use Electronic Medical Record

[37]. Of course, in the investigated studies other factors such as attitude toward use, the expected performance, social influencing and observability have been effective on the adoption of mobile health technology.

Conclusion

Although it seems that the use of information technology theories in implementing the new information technologies in health systems in Iran is in its infancy and does not take the implementation of new technologies into account, according to the results of this study, we recommend researchers and authorities to use these theories in order to implement new information technology in the health systems and particularly in mobile health. In addition, the results of this study showed that various factors influence the implementation and execution of mobile health. Of these factors, the perceived ease of use, perceived usefulness and facilitating conditions are the most important factors affecting the adoption of mobile health; therefore, it is recommended that these factors be considered accurately, standard and uniform implementation of Mobile health by policy makers and managers in order to execute this technology.

Conflict of Interest

None

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