A systematic review of mobile health adoption factors for Iraqi Healthcare Institutions

MR. Ali TahaYaseen
Department of Information Technology, College of Computing and Informatics, Uniten, Malaysia and Department of Computer Science, Dijlah University College, Baghdad, Iraq
Corresponding author: MR. Ali TahaYaseen

Assoc Prof. Dr Abdul Rahim Ahmad
Department of Information Technology, College of Computing and Informatics, Uniten, Malaysia

Dr. Saraswathy Shamini Gunasekaran
Department of Information Technology, College of Computing and Informatics, Uniten, Malaysia

Abstract---The advancement of new technologies, particularly information technology (IT), has a significant influence on healthcare as well as the quality of life. Mobile health is becoming increasingly important in healthcare. However, previous research on this area has been primarily anecdotal, scattered, and speculative. This study includes a comprehensive evaluation of mobile health implementations worldwide, as well as reporting on results such as difficulties, variables and advantages connected with mobile health adoption. However, as described in the literature, the adoption of this sophisticated innovation is a challenging undertaking; hence, careful thought and preparation to all critical elements that impact the adoption process through stakeholders is essential. The purpose of this research is to assess the factors that impact the adoption of mobile health frameworks in healthcare organizations. The study employed a non-experimental research exploratory research design. This exploratory study includes an important secondary data inquiry. The creation of an investigation and the modeling using secondary data in order to emphasize the research’s ultimate conclusions. Through a review of the literature on existing frameworks for mobile health adoption, it was discovered that healthcare institutions in Iraq require ongoing attention in order to obtain government support. Iraqi m-health services have developed slowly in recent years at various levels of the health industry and mobile services.
**Keywords**—Mobile health, M-health, E-health in Iraq, E-health adoption, Healthcare institutions.

**Introduction**

With the emergence of mobile technology, a new era of Information and Communication Technology (ICT) has begun health care delivery known as mobile health (m-Health) (Alam, Hoque, Hu, & Barua, 2020). M-health services are becoming more prevalent and well recognized. However, empirical research on potential consumers’ adoption of m-health remain unexplored. Indeed, m-health adoption is a health-related habit as well as a technological acceptance behavior.

M-health is described as a customized and collaborative health service with the objective of giving any person, at every time, through a mobile platform, providing constant and global access to medical tips and guidance (Rehman et al., 2017). Despite being categorized as a subset of eHealth, M-health is frequently seen as a different healthcare paradigm. M-health offers the potential to automate and speed up healthcare delivery procedures, save money, engage patients, and give them with better convenience and appeal through this new service. Furthermore, m-health is built on several distinct characteristics (for example, ubiquity, ease, instant connectivity, customization, and timeliness) that may be used to healthcare service and empower patient’s delivery in any context. As a result, m-health is widely regarded as a new paradigm in healthcare that is revolutionizing health services throughout the world. M-health technologies are regarded as a strong solution that includes, among other things, the administration of patient data, the monitoring of patients’ condition in an innovative manner, and the measurement of heart rate, blood pressure, and body temperature.

M-Health is a term that refers to medical and health activities facilitated by various mobility platforms such as wireless equipment, mobile phones, and monitoring devices (Kim, Patel, & Hinman, 2017). Electronic health (e-health), on the other hand, is the traditional method to deliver healthcare services that relies on wired connectivity and desktop computers. Mobile Health has evolved as an extension of e-Health, but this does not replace it. It is another means of providing health care that makes use of an innovating communication channel to link patients with their physicians while also giving access to data, boosting efficiency, decreasing treatment costs, and facilitating distant healthcare (Alam et al., 2020).

More than a billion individuals in the world’s poorest countries do not have a bank account, yet they own and use a mobile phone on a daily basis. We are increasingly seeing innovative programs that make modest health care available to this type of person by leveraging mobile phones as the key transactional instrument. These solutions, which employ a human agent network to handle currency deposits and withdrawals, extend e-health access to rural places in a way that is not only easier for users, but also frequently considerably less expensive than traditional ways (Tarhini, Mgbemena, Trab, & Masa’deh, 2015).
This research includes of available literature, publishing, and theories that explicitly focus on the issue of mobile health system adoption, with the goal of providing following debate and analysis. It will detect and seek to bridge the gap in literary knowledge. The secondary search of relevant items would identify existing works in this discipline, as well as analyze and assess the infrastructure of Iraqi healthcare institutions in order to estimate future potential and mobile health uptake, create approach solutions and infrastructure architecture. Also, compare and contrast the route plans for the various projects under consideration to help in the adoption of mobile health systems. (Pankomera & van Greunen, 2018).

During the COVID-19 crisis, the use of m-health services benefited both patients and physicians (Hollander & Carr, 2020). COVID-19 is not only deadly, but also infectious, thus preventative measures such as human distance could save a patient’s life. It has been discovered healthy people are becoming ill when visiting hospitals during the COVID-19 pandemic crisis (Quest, 2020). A report identified by Healthline (2020), demonstrates that physicians and paramedics are being infected with COVID-19, and that many individuals have died as a result of COVID-19’s contagious nature. As a result, a novel approach to health-care delivery, such as m-health services, is necessary. Similarly, the World Health Organization (WHO) has decided that employing mobile health apps for health surveillance is both possible and cost-effective (Alam, Hu, & Barua, 2018).

Many researches explore m-health and associated elements that influence this new adoption system, and they often employ both qualitative and quantitative methodologies. Despite extensive research on m-health adoption appearing in international journals across disciplines, an overview of mobile health literature adoption remains lacking. This type of evaluation represents a significant milestone in the field of research progress. It can give an opportunity to stand back and assess the collective wisdom gathered via an eclectic body of study that employs many examples, approaches, and theories (Alam et al., 2020). This effort is especially crucial when the results of different investigations contradict each other. The widespread availability of m-devices and Wi-Fi Internet has increased the popularity of mobile phone apps such as m-health. It is a cost-effective service that allows customers to break free from the constraints of time, location, and lineups (Al-Ajam & Md Nor, 2015).

The healthcare industry has long been marked by innovation aiming at improving life expectancy, quality of life, screening, and treatment alternatives (Aljohani & Chandran, 2021). In recent decades, there has also been a movement toward greater cost effectiveness and efficiency in healthcare. However, while previous research on mobile work is developing as a key area of relevance in healthcare, it is mostly anecdotal, fragmented, and speculative. Few researches have focused on how consumers’ characteristics, such as personal privacy concerns and customization concerns, influence acceptance behavior; even fewer studies have identified the essential elements that influence the adoption of this new technology. This study attempts to create a theoretical model to cover this research gap.
Research Background

The background material offered the obstacles connected with the deployment and acceptance of mobile health systems as the foundation for study, as well as how this may affect stakeholder satisfaction. The continual popular advancements in computer technology have spurred many firms to adopt new methods of dealing with customers in order to improve service, decrease costs, and maintain competitive advantage. The health sector is always seeking for ways to employ technology for these reasons, and for the customer, produce more appropriate health industry solutions. With the introduction of e-health, healthcare institutions have changed dramatically from the time when it was conducted in a customer's local branch. With e-health, a system may provide customers with access to healthcare services via a variety of electronic channels. It is regarded as one of the most effective e-health places (Adans-Dester et al., 2020).

The literature on health information systems (HIS) is expanding, with academics investigating how developments in information technology (IT) resulting in more effective health-care services Mobile communication technology in health care is one of the technologies that has piqued the interest of several academics over the last decade (Abdullah & Hassan, 2016; Sam, 2017). The widespread availability and usage of sophisticated smartphones and mobile applications has the potential to significantly change the way health care services and information are delivered at both the individual and organizational levels. M-health is one of these developing IT artifact's new paradigms, which involves the use of mobile communications devices like cell phones and PDAs to give customers or patients with timely health services (Aghazadeh, Pirnejad, Aliev, & Moradkhani, 2015).

Prof. Robert Isteparian coined the term "M-health," which he described generally as "the use of new mobile communications and network technologies for health care delivery." (Folaranmi, 2013). M-health is an important subset of e-health applications since there are an increasing number of e-health apps capabilities are now available on mobile platforms. M-health is a catch-all phrase for mobile computing, networking, medical sensors, and other technologies used in healthcare. M-health is a transformational IT service in the healthcare sector that promotes wellness, preventive, and self-management rather than crisis intervention (Kaplan & Litewka, 2008). M-health, as a transformational service, focuses on bringing about positive alterations and enhancements to the well-being of both people and communities. M-health refers to the use of mobile communications devices such as PDAs and cell phones to offer health services and information. Researchers have expanded the definition of m-health to include any wireless technology (e.g., GSM, Bluetooth, WiMAX, GPRS/3G, WiFi) used to convey different health-related data content and services via mobile devices such as mobile phones, PDAs, laptops, smartphones, and Tablet PCs (Wouters, Weijers, & Finch, 2017).

This section gives an overview of how mobile phones have revolutionized numerous aspects of our lives (such as health care), how the principle of m-health emerged, the impact of m-health in the search for enhanced healthcare in developing countries particularly and the Iraq context in specific, and some of the
issues and challenges in the adoption of these creative solutions (Chen, Ding, Zheng, Zhang, & Yang, 2018).

A new trend in healthcare innovation is visible inside the bounds of e-health. E-health is a newer word for health information technology that has been in use since 1999, it has mostly referred to the use of the Internet in health practice (Al-Moosawi & Nayyef, 2017). With the rapid global adoption of mobile phones, of which more than 6 billion people already own one, a new e-health industry called m-health (Labrique, Vasudevan, Chang, & Mehl, 2013). M-health, in general, refers to the use of wireless technology to communicate and enable different data services and contents that are conveniently accessible by health professionals via mobile technologies like mobile phones, PDAs, Tablet PCs, laptop computers, and smart phones (Bergmo, 2015). Despite the fact that many m-health services are used by both patients and health professionals, this definition focuses solely on health workers as mobile health service customers. This study defines m-health as a customized and interactive health service that provides any user, at any time, with ubiquitous and universal access to medical advice and information using a mobile platform, with an emphasis on such m-health services. As a result, many people regard m-health as a new healthcare paradigm that is transforming global health services (Agnihothri, Cui, Delasay, & Rajan, 2020).

![An Interrelationship among m-health, e-health and m-telemedicine service](image)

Figure 1. An Interrelationship among m-health, e-health and m-telemedicine service
(Akter, D’Ambra, Ray, & Hani, 2013)

Health systems management has been dubbed the "hidden" health profession. E-health and telemedicine have grown in popularity over the years. In wireless telemedicine systems, M-health was presented as “unwired e-med.” (Al-Moosawi & Nayyef, 2017), and could be defined as “mobile computing, medical sensor, and communications technologies for health care”. Smartphone and wireless technologies improve healthcare by providing portable or wearable devices that allow patients to get central healthcare services more swiftly (Hu et al., 2016), and may be able to provide healthcare services around the clock, seven days a week. E-health and m-health systems that are well-designed serve as indirect-care "professionals" who care for their patients and have become critical components of today’s healthcare systems.

M-health has grown significantly during the last few decades. This is mostly owing to the rapid rise of mobile phones. For the first time, For the first time, the total number of mobile users is likely to exceed eight billion in 2019, with 8.3
billion subscriptions in 2019. The overall number of subscribers grew by around 393 million between 2018 and 2019. With a global population of 7.7 billion people as of 2020, the number of smartphone subscriptions presently outnumbers the total number of people on the globe (Statista, 2020). M-health apps that help in patient care, record patients’ respiratory rate, gather community and professional health data, promote healthy behavior, and increase healthcare information knowledge have been more widely available in recent years. The growing use of mobile communication technologies has resulted in the fast growth of the mobile app market. With about 1.7 billion people using them in 2017, health care applications are among the most downloaded and utilized apps in mobile markets (Economist, 2019). According to a recent study, the global m-health business was valued at $13.2 billion in 2016, and it is expected to increase to $46.2 billion by 2021 (Barton, 2017). This type of growth opens up a number of options for both health care app developers and providers. Crico et al., (2018) revealed that the majority of customers used m-health apps on a regular basis.

According to Herzlinger (2006) six forces which can aid or impede innovation efforts: industry participants, finance, technology, public policy, customers, and accountability. These factors for healthcare innovation are classified as stakeholders by the following: organizations; physicians; patients; innovative firms; and regulatory bodies. It can be summarized the following stakeholders based on their particular interests, requirements, and expectations: providers, regulators, funders, technology vendors, patients, and health organizations are all involved. When it comes to m-health adoption, Healthcare regulators (for example, ministries), healthcare organizations (for example, hospitals), and healthcare financiers (for example, health insurers) all perform the same role: they determine policy from the top down (De Pietro & Francetic, 2018). They are especially concerned with m-cost-effectiveness health's and efficacy. Healthcare professionals and patients are the key users of m-health solutions, and they are most concerned with clinical outcomes. M-health solution providers are technology and innovation enterprises that are primarily focused with profitability and improved outcomes. Preventive care physician comments, as well as patient and physician reminders, have shown mixed to modest results (Hung & Jen, 2012). Many patients are not just out of date on their preventative treatments, but they are also often disregarded during clinic sessions. Health management is an integral component of preventive medicine; it supports healthy people in maintaining their health and chronic patients in recovering. National health programs must encourage citizens to participate in health management activities in order to minimize demand for healthcare services.

Mobile applications may now perform a range of important activities, such as symptom evaluation, psychoeducation, resource finding, and treatment progress monitoring. Health care has emerged as a robust study subject for developing nations among the several research fields that explore the application and efficacy of mobile phones. Given the increasing prevalence of mobile phones in developing nations, this technology might enable health care professionals to provide more effective services and higher quality treatment to wider parts of their populations. In poor nations, m-health applications include Increasing access to health-care services, diagnosing and monitoring Chronic illnesses, fostering better lifestyles, and spreading public health information are all priorities. However, research on
the influence of mobile phones on general behavior and health consequences in developing countries in particular is lacking. More significantly, the processes for Mobile health adoption and the compatibility of m-health technology in underdeveloped nations remain unclear. The Iraqi health-care business, which is the subject of this research, has lately been altered with modern technology in order to increase its efficacy (Al-Moosawi & Nayyef, 2017).

**Electronic Health Technology (E-Health)**

The Internet is a global network of networked computers that supports billions of people around the world by utilizing the standard Interconnected computer networks. The Internet has increased in popularity for a variety of uses, including not only online shopping, commercial marketing, and education, but also practically every aspect of human life, including individual health management. It is a network made up of millions of local-to-global commercial, public, academic, and government networks that are linked together utilizing different electrical, wireless, and optical networking technologies. This not only aids in the completion of human jobs and the facilitation of their life, but it also alters the way individuals think, manage, and effectively complete the duties. As illustrated in Figure 2, the usage of internet technology has been gradually expanding.

![Figure 2. Internet Usage (Sustainable Development, 2019).](image)

Smartphones have evolved the essential components of our daily performance, with the increasing speed of technological advancement. The world’s people today are getting a new dependency. The Smartphone is the name given to this new addiction. Smartphones today have so many features that their users can scarcely manage to put them down for a second. These cellphones not only give some of the same functionality as a personal computer, but they also deliver a high degree of entertainment. People nowadays have hectic lives owing to job, education, and personal issues. As a result, they choose to have a mobile device that allows them to keep in touch and be accessible at all times.
Electronic Health in Diverse Countries

To gain a competitive advantage, most nations, including India, China, Germany, the United States, and Russia, have made every effort to preserve their information systems and establish their own knowledge exchange platforms. In sophisticated nations, mostly in Europe, such as Germany, France, the United Kingdom, Norway, and Sweden, medical information systems are so robust that most hospitals are electronically linked to one another (European Commission, 2015). Recognizing the potential of electronic health technology, governments in these developing nations aspire to gain a competitive edge by investing in information systems that provide residents with distinctive and convenient services. Over the last several years, Arab nations have seen a lot of growth and enormous changes in their health sector, particularly in the Middle Eastern area, including Iraq in particular. The Arab nations have made efforts to properly administer healthcare services, and the majority of these countries have reduced their death rate (WHO, 2010). Some of the applications of Electronic health in the Arab countries are as in Table 1.

Table 1
Electronic health technology facilities in the Arab Countries

<table>
<thead>
<tr>
<th>Study (Date)</th>
<th>Electronic health facility</th>
<th>Activity</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Atallah et al., 2018)</td>
<td>Mobile phone apps catering patients’ mental health and providing them with a choice of apps for monitoring, evaluation, education, and therapy.</td>
<td>Electronic health system was recommended for usage by mental-health patients. The system provided easy access to the users.</td>
<td>Palestine</td>
</tr>
<tr>
<td>(Sijbrandij et al., 2017)</td>
<td>STRENGTHS programme Problem Management Plus (PM+).</td>
<td>The objective of this facility is to reinforce the timely of healthcare systems influenced by the Syrian refugee crisis and to considerably decrease the load of illness among deprived individuals, such as refugees who were influenced by the war</td>
<td>Used by WHO for Arabian refugee and Europe countries</td>
</tr>
<tr>
<td>(Alanzi, 2018)</td>
<td>Electronic health for diabetes patients connecting service providers, consumers (patients) and healthcare workers.</td>
<td>Provision of a virtual private network to facilitate communications between healthcare providers and users via phone calls and text messages.</td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>(Alnasser et al., 2019)</td>
<td>An interactive, an easy-to-use software for tracking daily physical activity and food consumption and providing personalized weight evaluation and goal setting Physical exercises. Self-monitoring. Social support to help with</td>
<td>The health deity’s suggestion.</td>
<td>UAE</td>
</tr>
<tr>
<td>weight-loss guidance (Android and iPhone OS platforms)</td>
<td>weight loss through dietary and physical activity changes.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This technology plays an important part in resolving health issues by allowing patient engagement and monitoring in a comfortable and effective manner. This leads to an increase in both the amount and quality of patient outreach. However, the use of electronic health is still in its infancy (Lee, Wong, and Lee, 2020). Furthermore, the application of e-health is limited to general healthcare management and only a number of types for services, such as Health deity, mental, and others, as displayed in Table 1. Considering the increasing trend of patients, especially in the pandemic coronavirus, it is timely and relevant to implement Electronic healthcare to control and manage diseases.

Gholamhosseini & Ayatollahi, (2017) found that electronic health through usefulness of the usage positively decrease user’s errors as compared to non-users. Despite the importance of Electronic health in improving the quality of health services, its use is still limited (Lee, Wong, and Leelee, 2020), especially in the Arab Region. This leaves a research gap on the understanding and identification of factors that can affect the advanced of e-health adoption system which is M-health system.

**M-Health Definition**

The World Health Organization (WHO) has defined mHealth as "medical and public health practice assisted by mobile technologies, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices," in partnership with the Global Observatory for eHealth. Furthermore, mHealth is regarded as a subset of e-health Figure 2. E-health is a wide, umbrella word that refers: “health services and information delivered or enhanced through the Internet and related technologies” (Ake & Arcand, 2020).

---

![Figure 2: E-health and M-health Relationship](image-url)
**Types of m-Health**

There are several sorts of m-health technologies accessible across the world. These technologies may be found in a variety of devices and in a wide range of applications. Some m-health devices are pre-loaded mobile applications that provide information. Others require extra gadgets to be "clipped" or "fitted" onto the mobile phone itself in order to serve as a diagnostic tool. These tools are capable of assisting healthcare practitioners and providing real-time results.

**Research Methods**

This study would be constrained by an exploratory approach and would rely on secondary data. The Literature search is the source of secondary data acquired for this study; so, the purpose of this literature search would be to evaluate previous works relevant to the topic area. This will accomplish the study's goal of evaluating the elements that contribute to the development of a mobile health adoption model for both commercial and public healthcare organizations.

The purpose of this systematic review was to compile existing information about the variables influencing healthcare professionals' use of mobile health (m-health) applications. Results The search approach yielded 518 potentially relevant publications, 27 of which fulfilled the inclusion requirements. Main perceived m-health adoption variables at the individual, organizational, and contextual levels. This evaluation would include an evolving search of websites, conference papers, information collection, and published material. A variety of searches were conducted on articles and journal reviews, as well as daily newspapers. Relevant keywords were chosen to conduct a targeted web search such as: “mobile health”, “m-health”, “e-health”, “m-health adoption”, “healthcare institutions”, “Iraq”.

---

![Diagram of Systematic Review of Study](image-url)
Literature review and Previous Works

The purpose of this review was to consider the history of the development and use of mobile health systems, underlying theoretical frameworks, existing literature on the level of this system, potential barriers and solutions to issues for health implementation, and current initiatives to encourage better use of mobile services. The goal of this review is to set the stage for the numerous barriers to m-health adoption. The literature review provides empirical data from investigations on this issue. The preceding study will provide data on national and global advancements in these new systems.

According to the existing literature, every new system adoption, such as new technology, should ideally include the development of a model (De Pietro & Francetic, 2018). Using the model is expected to help in the deployment of an m-health system because it makes the process more viable and structured, increasing the chance of a successful roll-out of a policy or program (Meng, Guo, Peng, Lai, & Zhao, 2019).

Alalwan et al., (2018) conducted a research using a convenience sample size of 365 people and was evaluated using structural equation modeling. This study attempts to investigate the most critical elements that may influence Jordanians' willingness to utilize m-health. Four elements were postulated as major predictors of behavioral intention: perceived utility, social influence, awareness, and innovativeness. This study did not include the impact of the resources and facilities required to use m-health, which is an important topic that should be investigated in future studies. Their study did not look at the effects of age and gender on moderation. This study was done in Jordan, and as a result, evaluating the connected difficulties of m-health in other developing and developed nations might give more understanding in this regard.

Individual perceptions, social influences, trends, ease of use, technical complexities, and system security, as well as a lack of exposure, appropriate skills, and awareness to utilized the newest mobile phones, are factors that could affect public acceptance of e-health systems in Middle Eastern countries, according to studies in the literature (Aljohani & Chandran, 2019; Kim et al., 2017). So far, many sorts of models have been presented by recognizing a number of significant aspects in Middle Eastern nations.

So yet, just a few mobile apps for coronavirus have been created. Prior study discovered that the majority of mobile health applications produced in Bangladesh have usability issues. Previous research indicates that usability is critical for service uptake and retention (Alam et al., 2020). In their research, they did not examine the usability of the COVID-19 mobile applications. However, they discovered that the majority of the COVID-19 applications provide similar types of services, and that a considerable number of residents are unaware of these applications. Mobile applications might provide services such as remote help, mental health support, awareness information, corona virus education, and monitoring and connecting with quarantined persons. Creating such apps would be a more cost-effective, efficient, and viable digital intervention to prevent the COVID-19 pandemic.
An integrative study model for the variables influencing the uptake of telemedicine health services during the COVID-19 pandemic crisis applied by (Rahi, Khan, & Alghizzawi, 2021). According to the findings of structural equation modeling, UTAUT, PMT, and the DeLone & McLean information success model explained 80.4 percent of the variation in patient attitudes about the adoption of telemedicine health services. They advocated replicating this study methodology once the situation had been moralized and individuals had recovered from the COVID-19 epidemic. In addition, the protective motive hypothesis has four components: perceived vulnerability, perceived severity, reaction cost, and response efficacy. As a result, while this study model is being undertaken in a poor nation, analyzing it in rich ones might yield fascinating results.

UTAUT has been chastised in the health care environment for its emphasis on generic technological acceptance characteristics and failure to fully explain m-health uptake. Alaiad et al. (2019) have claimed that when patients feel health dangers, they have a positive attitude toward utilizing mobile health apps. They suggest include components known to constitute barriers to technology adoption, as well as structures connected to health-related behavior. Other research has corroborated the influence of perceived health dimensions on perceived utility of technology usage in connection to health (Agnihothri et al., 2020).

Alam et al. (2020) discovered that perceived trustworthiness is a primary factor that encourages consumers in Bangladesh to utilize health technology. They combined UTAUT with privacy, lifestyle, self-efficacy, and trust to investigate the characteristics that impact m-health application uptake among the younger generation. The findings revealed that behavioral intention was positively impacted by performance anticipation, social influence, hedonic incentive, and privacy, whereas enabling circumstances, self-efficacy, trust, and lifestyle influenced both behavioral intention and actual usage behavior. Further, Alam, Hu, & Barua (2018) also documented that the reliability of health care technology plays a commanding role in decision making process of Bangladeshi tech product users. On the other side, researchers in wearable fitness technology adoption and use also incorporated some other external variables in the original technology acceptance model depending on the different context of use (Kim et al., 2017). As a result, it is unclear what reasons are driving the adoption of m-health apps in resource-constrained developing nations such as Iraq.

Meng et al. (2019) it was shown that physiological deterioration affects older persons’ usage of mobile health services. This survey of 395 older consumers was carried out to confirm their research model and hypothesis. As a result, to aid in aging in place, tailored solutions that take usability into account should be designed to fit the changing requirements and skill levels of older persons. In addition, this study evaluated decreasing physiological conditions and hospital assistance in an integrated framework to explain senior consumers' intents to utilize m-health services and experimentally examine the trust transfer mechanism. However, their study did not include users of all ages. The elderly were chosen as the sample since they make up a high proportion of all m-health service customers. They proposed a comparable research in a western environment to compare the outcomes across cultures.
Lin, Bautista, & Core, (2020) similarly examined in their qualitative study m-health adoption among Singapore seniors, semi-structured interviews were conducted with 35 mobile phone users ranging in age from 58 to 82 years old. This research looks at how elderly in Singapore utilize mobile devices for healthcare. The findings are not entirely applicable to elders living outside of Singapore. They proposed expanding the scope of the study in the future by performing cross-country comparisons with seniors from other nations. This study only discovered a few seniors who used m-health apps. Patients believe using m-health enables them to improve their disease management, thus improve health outcomes and reduce their dependency on doctors.

Another study “m-health adoption among primary care physicians in Malaysia and its associated factors: a cross-sectional study”, conducted by (Lim et al., 2021). A self-administered questionnaire was employed in this cross-sectional research of primary care doctors (PCPs). PCPs’ use of m-health apps has been separated into two categories: use of m-health apps to support PCPs’ clinical work and referral of m-health applications for patient use. Multivariable logistic regression was used to examine the factors related with m-health uptake. They believe that qualitative research will help overcome the hurdles to suggesting and integrating patients’ m-health applications into the clinical treatment pathway. Furthermore, future research in this field might benefit from a more in-depth examination of the emphasis and functionality of m-health applications used by physicians and patients in terms of their ability to enhance care efficiency and the impact of secondary prevention on disease burden and patient visits.

Khatun et al. (2016) illustrated in their research that m-health eases and widens the availability of health-care service through specialists at approachable costs. The process has shown its convenience through users. The research acknowledges that this system has its advantages and disadvantages. The survey results clearly suggest that participants liked m-health services and are eager to utilize m-health in the future, with an emphasis on training to use mobile phones, offering low-cost services, and winning confidence. Given the foregoing and past research into mobile health, this study will seek to explore the status of mobile health and the variables influencing it by changing these settings and testing a new proposed model based on the specific conditions of Iraq.

This section examined the most relevant publications in the IT and m-health adoption models literature review. The majority of these empirical research are based on theories such as UTAUT, TOE framework, DOI theory, and institutional theory. It is clear from the preceding research that the variables impacting the adoption of m-health by healthcare facilities in Iraq have been largely disregarded. As a result, the purpose of this study was to investigate these aspects. Furthermore, the literature research revealed that there are only a few published publications that examine m-health models from diverse perspectives, particularly during the COVID-19 period.

**Contribution and significance of the Study**

The findings of this study are expected to contribute to the adoption literature in the field of m-health and in underdeveloped nations. More specifically, to bridge
the gap that exists in Iraq as a starting point for further research. This inquiry study is also commonly used by healthcare institutions to improve m-health services and to identify those factors that may either contribute to the failure or success of m-health services, and it may be more useful for decision making.

Given the increasing use of smart mobile phones in Iraq, preliminary experience with mobile health intervention demonstrates that this sort of communication can provide a cost-effective approach for healthcare support while also improving patients’ quality of life. It is widely acknowledged that Iraq lacks quality health services in both urban and rural areas, that the general population’s healthcare status is poor, that the prevalence of chronic disease and COVID-19 has increased in recent years, and that evidence-based disease management strategies are severely lacking. However, there is an urgent and timely need for innovative ways for offering healthcare research and enhanced medical education that are based on evolving communication, computer, and internet technologies, such as an m-health system that provides improved healthcare services.

The findings provide insight into the issue-facing uptake of mobile health by field practitioners. Aside from that, the findings may be utilized to develop an effective strategy for reaching all patients who do not have access to m-health solutions. According to academics, the findings of this study encourage the addition of information to m-health in Iraq. Furthermore, the work serves as a reference for future research. The findings of this study are applicable and valuable to both healthcare facilities and patients. This research may be used by healthcare organizations to improve their profitability, performance, and service quality. For long-term survival, they can focus more on communication and environmental elements. Healthcare institutions can utilize the research model to gain a better understanding of why certain healthcare institutions choose to implement m-health while others do not.

**Conclusions**

This article examines the availability of mobile health frameworks for both commercial and governmental healthcare institutions in underdeveloped countries, including Iraq. According to a study of these research, these institutions in Iraq require constant attention in order to get government funding. Iraqi electronic hospitality services have been restricted in recent years in many levels of healthcare facilities and mobile services: tertiary, secondary, and even primary level, as well as in determining the practicability of the present method. According to the findings, interventions and programs aimed at increasing mobile health adoption should include a focus on the level of practice because that is where adoption decisions are made, as well as assistance to IT managers within health institutions in changing their workflow to obtain the most services, as well as addressing privacy concerns and explicitly acknowledging. Furthermore, in order to ensure higher generalizability of the findings, the study will present a variety of scenarios. All of these results are particularly pertinent to decision-makers in Iraq who are now presented with an obstacle to m-health adoption.

One of the study's flaws was that all of the information was acquired from secondary sources, resulting in single-source bias. Furthermore, because there is
no post-data assessment, the study's result is more subjective. Healthcare businesses should figure out how to explain their patients’ expectations and priorities, apps, and their own premise data before integrating their framework. As a result, it is proposed that future researchers conduct a field survey by collecting primary data and doing statistical tests on the study variables in order to investigate the elements implicated in the study's results.

References


Lim, H. M., Dunn, A. G., Muhammad Firdaus Ooi, S., Teo, C. H., Abdullah, A., Woo, W. J., & Ng, C. J. (2021). mHealth adoption among primary care...


