Consumers Attitude towards the Use of Mobile Health Apps: An Empirical Review

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Abstract

This study aims to examine the consumers attitude towards new Mobile Health Application (MHA) for health care industry. This paper aims to improve understanding the reasons why patients and medical professionals would use mobile applications. A survey instrument was developed to gather data and an equal number of sample from groups were drawn who completed this study.

The results indicate that there is favorable attitude towards new MHA and medical service locator, medical education, patient caring, personal care, imaging, patient monitoring were the significant features for new apps. The results suggest that new functions need to be incorporated into the development of MHA to satisfy the needs and wants of both groups.

The paper concludes with a discussion of how to promote this apps with in patients and medical professionals.

Keywords:

Attitude, Mobile, Health Apps, Promotion

1.0 Introduction

Mobile Medical is used to denote how mobile and wireless technologies can be used to improve health-related services. The field of Mobile Medical has undergone rapid changes and continues to move up the healthcare agenda (Istepanian etal., 2012; Sebelius, 2011; Varshney, 2011). Smart phones can now be used to track, manage and improve health (Kailas et al., 2010; Landau, 2012a; Landau, 2012b). Perhaps the most visible element of Mobile Medical is the profusion of phone applications (apps), especially the ones related to fitness and wellness. These "apps" are widely used by consumers and medical professionals (e.g., patients, doctors, pharmacists, and others).

A systematic literature review by Ozdalga et al. (2012) yielded a list of consumer-focused medical apps containing, among other features, monitoring, educating, and communicating. Several of the apps were mainly aimed at advising users about medical issues (e.g. advise them whether or not to visit their GP, based on analysis of a medical problem). Others' main functionalities revolved around acting as a personal assistant for patient-specific health issues (e.g. keeping track of food intake for patients suffering from diabetes, and generating alerts when necessary). Popular features of apps included maintaining users' medical records, generating alerts and reminders, and generating advice or information based on user input. Mobile Health is used to denote how mobile and wireless technologies can be used to improve health related services. Smart phones can be used to track, manage and improve health. Marekt research firms have issued predictions for global health applications downloads in 2012 that vary widely from over 40 million to nearly 250 million (PWC, 2012). The main categories of mobile health apps that are in use are reference apps wellness applications, social media apps and apps deigned to access health records and personal health information.

Applications developers concentrate mainly on bringing the contents of a computer device to a handheld device so that the end user can find information anytime and anywhere. These mobile applications are transitioning into the health care industry rapidly because it has great benefits and advantages to the industry itself. This is done through immediate diagnosing or treating of patients. This

gives faster results and information to the patients in need.

We will be introducing a smart phone and tablet PC application with the name of Mobile Health Application that will provide end users with immediate healthcare information. This information would assist and benefit them at any time, place, or platform. The proposed Apps will simplify the long process of choosing the right healthcare center by making it more convenient and less stressful for patients to choose their desired location. The application would find the nearest, best, and most convenient healthcare institution that the user is looking for in a matter of seconds. Moreover, this application will deliver useful information for the end user including hospital locations, hospital ratings, physicians available, and professional advice. Users will also be able to rate the healthcare facility or specialist, as well as, give feedback by commenting and sharing their experience. Additionally, patients will have the choice to locate the nearest hospitals according to their location in case of an emergency.

The hospital finder application, Medical Service Locator, will include services such as healthcare facilities and medical professionals contact numbers with an immediate call button, the location map, working time, and other information regarding the center, for instance whether it is governmental or private. In addition, the end user will be able to search for information based on the location and the specialty he or she provides, as well as adding this information to their address book, and emailing it to themselves. Moreover, users will be able to rate the healthcare facility or specialist, as well as, give feedback by commenting and sharing their experience. Users will also be able to find general medical information, news, and tips.

2.0 Literature Review

2.1 Definition

Apps are software applications, designed to perform specific tasks that run on smart phones and tablets. For example, apps can locate gasoline at the lowest price in the area, provide directions, play games, and assess health conditions. Apps install in seconds, are free or have a nominal cost, and are always available" (Randolph, 2013).

There are no fewer than 40,000 medical related apps currently available in this industry. As for the diversified usage of the medical applications by regular people, 31% of cell phone owners have used their phones to access health information and 19% have installed an app to manage their everyday health. Other most downloaded applications are apps that can track blood pressure, pregnancy, blood glucose or diabetes, and medications. On the other hand, some mobile health-related applications are used by health care professionals, such as smart-phone-based ultrasound application that enables the doctors to view images and X-rays. (Pew Research Center, 2012)

Mobile health applications are usually installed and used on smartphones and help the customer to increase their fitness, be aware of health threats, monitor their health status or provide other specific health relevant information. Although most of the applications in this category have the same goal, to increase the health of the user, there are two general groups of apps. The applications focus on the fitness and nutrition of the customer and for example provide information on the heart frequency while running, monitor the calorie intake or provide training programs for distinct body parts. The second group consists of applications, which have a stronger medical focus. They for example provide information on pollination or first aid, help to measure blood pressure or help to analyse skin and enhance early detection of skin cancer.

Several types of mobile medical applications are those that use attachments, display screens, or sensors similar to an existing medical device. However, those medical applications that are intended to be used as devices are a relatively small proportion of those available for use. There are numerous types of applications that are not being considered for regulation. First and foremost, those applications that are used as reference guides for clinicians (Freshwater, 2011; Oehler et al., 2010) and health and wellness records (e.g. diet and weight logs, prescription reminders, etc.) for consumers (Jen, 2010; Kailas et al., 2010) are not being considered for regulation.

2.2 The Rise of Mobile Healthcare Applications

The past two decades show that the access to information technology has rapidly increased in computers, and mobile phones in specific. As a result, this lead to creative approaches in using computers and mobile phones in health related matters such as consumer behavior change, patient support, staff training, and management information and logistics systems. Furthermore, in 2003, the World Health Assembly declared that regions around should start contributing to strengthening health

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systems by supporting eHealth. Later on, in 2009, mHealth Alliance was created to connect wireless technologies to improve healthcare outcomes. The alliance was founded by the United Nations Foundation, the Rockefeller Foundation, the Vodafone Foundation, GSMA, an international mobile phone policy and technical group, the US Presidents Emergency Plan for AIDS Relief (PEPFAR), Hewlett Packard, and the Norwegian Agency for Development Cooperation (eHealth, mHealth, Reproductive Health, 2012).

Mobile applications are progressively playing a role in healthcare delivery and the training of healthcare professionals. A research has been conducted to review the 500 top medical applications in order to examine the availability, popularity, and prices of apps. The results reveal that in terms of popularity, applications that are designed for public education were the most popular. In terms of prices of apps, the data shows most apps (77%) are free.

There are dramatic changes happening in healthcare and the increasing impotence of data, in which IT systems need to be high powered analytical tools that can deliver actionable data to clinicians and executives. Weinstock (2012) states that over the past one or two years there has been much focus on information technology in clinical applications, such as having health information exchange.

According to the Journal of Science and Healing, smart phone applications are rapidly emerging as effective and unique sources of health information, and patient self management tools. These mobile apps allow patients to be more informed, and supports patient centered models of health care, through the involvement and self management of patients. These apps can also help in public health initiatives regarding tracking capabilities and strategies that help patients manage their health and wellness in areas such as obesity and smoking. In addition, these mobile apps are highly accessible, and cost effective. (Koehler, Vujovic, and McMenanmin, 2013).

The fast-growing mobile medical app market was worth $150 million in 2011 where the average cost of an app is about $15. These applications are being developed for health education, health management, data management, and other health workflow processes. The health related apps make up about 1%-2% of the entire market for apps, and will grow 25% annually over the next 5 years. Revenue of these apps is generated due to their premium pricing as opposed to volume (Anderson, 2013).

2.3 Examples of Mobile Healthcare Applications Used By Doctors

The rapid rise of mobile smart phone has brought with it a creation of new software application that aids the user with a vast range of information and tools. Those in the medical field have seen a dramatic rise in applications that are specifically designed in their medical practice and have made it more effective, efficient, and convenient. These medical applications have the potential and capability to revolutionize the practice of medicine and make it more adaptable to our age of technology. It has aided doctors in their fields through having these medical applications improving their practice of medicine which has made them more effective and efficient.

Nowadays, there is a visible increase in the use of mobile phones by health professionals in their medical practice. Mobile phones are used as a tool for sending and receiving text messages from their patients, and searching the web for symptoms, diseases, or recent health news. Also, mobile phones are used as a tool for doctors to take clinical pictures and videos as well.

There are so many applications that medical professionals have managed to integrate their usage in their medical practice. The following medical applications are considered to be the best medical application voted by doctors. “Brain Tutor” is a great application that is used by doctors and medical students for a 3D brain imaging created from MRI scans. Another application is Cancer Care Ontario Symptom Management Guides where it is used to manage a patient’s cancer symptoms. “Epocrates” is the top mobile drug reference and it provides extensive information on medication and diseases. MedCal is another application that has been downloaded more than 800,000 times and it features 200 health-field formulas, scores, scales, and classifications. Moreover, the Merck Manual is another medical application that contains information on diagnosing and treating medical disorders (Malek, 2011).

According to Kabachinski (2011), 72% of physicians have smart phones and that number is expected to climb to 82% by next year. Many physicians have several smart phones and tablets and they use them for references, scheduling, and to assist them in diagnosis.

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2.4 Mobile Healthcare Applications

Krouse (2012) research study shows that there is a high level of ownership and usage of smart phones by both groups, indicating the acceptance and the need to create more medical applications from the medical point of view.

A survey from the Pew Research Center's Internet and American Life Project reported that 17 percent of cell phone owners have used their phone to search about health-related information. Young adults aged 18-29 (29 percent) and Hispanics (25 percent) were the top users. In addition, a research2guidance report estimates that 1.4 billion people worldwide will have smart phones by 2015, and one in three people will have downloaded a health-related application on their cell phones.

A study has been conducted to assess the attitudes of medical professionals towards the usage of the internet and applications in their medical setting. A hundred and forty one participants have completed an online survey with questions pertaining to their own usage of mobile phones, the internet, healthcare facilities, and their attitudes towards medical professionals using the internet during consultation. Attitudes of the participant have been assessed through a 5 point scale. All participants owned a mobile phone, with 82% owning one with application support. Generally, there was a favorable attitude towards the usage of medical internet web sites and application during clinical practice (Koehler, Vujovic, and McMenanmin, 2013).

Forty-three healthcare professionals have completed an online survey and the results indicate that 91% of healthcare professionals owned a mobile phone of which 87% used it during clinical practice. Moreover, ten out of eleven healthcare professionals had significantly more positive attitudes towards internet than mobile phone use in clinical practice. However, attitudes for eight of the ten statements concerning the usage of mobile phone were positive. These findings suggest that smart phones may become an important resource in medicine and clinical practice in the future (Koehler, Vujovic, and McMenanmin, 2013).

To conclude, the evolution of health has digitized our world and has benefited the field of medicine immensely. There is a visible rise in mobile healthcare applications and an increase in the downloads of these apps which has played a vital role in the medical field. By looking at the research done, the rise has benefited the healthcare industry and is well integrated in the medical industry. Furthermore, both patients and medical professionals have downloaded and used these medical applications, benefiting both parties immeasurably. Additionally, throughout the studies and surveys conducted, a favorable and positive attitude is detected among patients and doctors towards medical apps. According to these studies and surveys done, we have noticed that there is a need to create more medical applications where both patients and doctors have accepted and are satisfied with the outcome. This would place patients and doctors in one platform, where patients can find and contact their desired doctor quickly and easily.

3.0 Research Methods

The survey instrument was constructed to measure participants attitude towards After accessing the information that has been gathered from third-party sources qualitative and quantitative research methods were used to specifically gather data for this study. Qualitative research was executed through conducting interviews, and quantitative research was implemented by conducting data through surveys.

The participants of the surveys we will give out are medical professionals and potential customers (patients). Pilot study with small sample was conducted and the questionnaire was revised based on initial findings.

Survey s will be disturbed to doctors in order to get an insight from professionals in the fields. Surveys will also be handed out to patients in order for us to grasp what the users of our application want the application to have regarding information, features, and preferences. The survey was piloted in the beginning for five participants. The questionnaire was modified to accommodate the suggestions of the participants. Data was collected from 50 medical experts and 50 patients (users).

The survey consist of multiple choice questions and a likert scale of 1, which is equal to strongly disagree, to 5, which is equal to strongly agree, was used to measure the data. The “Medical Students’ Use of and Attitudes towards Medical Applications” research paper was used as a sample to develop the survey questions. Furthermore, the survey contains questions about demographics, smart phone ownership, including type of mobile phone, and the awareness and usage of medical apps. Moreover, the questions also give the participant the chance to choose what information they would like to be available in the application and what features will be useful and

beneficial to them. Finally, the data collected was analyzed using SPSS software where it shows the level of smart phone ownership, awareness and usage of the medical applications available, and the information and features that they want the application to include.

Four depth interviews were medical expert, patient, marketing manager and an application developer to get different views in how to promote the application. The questions of the interview are related to the promoting of our mobile medical application; the questions illustrated the interviewee's opinion about the best way to market the application. These interviews results were used to develop marketing strategy to promote the new application.

4.0 Data Analysis

In terms of demographic data, medical experts that were surveyed, 74% were between the age of 25-35% and the most of them were female. In addition, patients were surveyed, the majority was between 25-35 years (52%) and 60% were female.

94% medical experts own mobiles that support the use of applications. Furthermore, the result of the patients indicates that 98% own a phone that supports the use of applications. On the other hand, the results show that 74% of medical experts are aware of medical applications that are available for smart phones, but only 64% of these medical experts use medical applications on their smart phones. Subsequently, remaining medical experts are aware of the existence of medical applications choose not to install them on their smart phones. As for patients, 54% of the participants were not aware of the existence of medical apps for mobile phones before this study and 94% have never heard of DHA's or MOH's (Ministry of Health) health application for smart phones. This shows that after creating the application a superior marketing plan should be implemented to help spread the app to the most crowds possible, and explain its functions and benefits clearly. As for the kind of information that the users wanted to be included in our Medical Service Locator application, with both survey categories, medical experts and patients, "List of the specialties and treatments", "List of hospitals along with calling option" and "Hospital and doctor description"

The respondents of the survey were asked to choose the features that would be most useful in the application. "Finding the nearest hospital location" has the highest mean in both our participants analysis. This also proves that medical experts do believe that in case of emergencies the sooner you get to a hospital, the more chances you get to being treated and survive. On the other hand, it can be illustrated from the analysis that medical experts think that it is least important to provide save the information in the address book since it has the lowest mean (3.8). Whereas, the patients thinks that the text message service is least important among the other features with a mean of 4.2. Overall, it can be analyzed that all the respondents on average agree with all the features.

5.0 Conclusion

There is currently little evidence-based research that can directly support the health benefits of mobile health applications, there is a good reason to believe that these applications have potential to significantly benefit overall health. However, both medical practitioners and patients need to know that privacy, security and safety of these applications are adequately addressed before mobile health application can be successfully integrated into the healthcare system.

Mobile health Application allow patients to take control of their own health, especially in areas of healthy eating, managing chronic disease and quitting smoking (Varshney, 2011). Additionally, personal health records, which include medical history, laboratory health results, and insurance information, help people manage their lives and actively participate in their own health care (Pratt et al., 2006). For doctors, this application can help provide point of care resources and aid in managing their practices. Patients predict that MHA will improve the convenience, cost and quality of their healthcare in the next three years (PWC, 2012).

In conclusion, the most important finding in the study is that there is a need for the new mobile medical application because of its numerous benefits that would have positive impact on the community. Furthermore, there are certain features that would definitely be included in the app due to its high admiration among both medical experts and potential customers (patients), such as "Finding the nearest hospital location". Having both potential customers (patients) and medical experts favoring the same features shows its importance to both parties. Additionally, the kind of information that was highly desired to be included in the app is the function of a "List of the specialties and treatment" by both participants, which proves its significance. In terms of narrowing down search results, patients and

medical experts had different opinions, where 44% of medical experts preferred filtering the search results by hospital names. On the other hand, 54% of patients choose filtering the search results by location information. Furthermore, 64% of medical experts use medical applications to help provide point of care resources and aid in managing their practices. Doctor's list privacy and security as a concern as the leading barrier before it is widely used. Data security, access control, policy and confidentiality are the main issues that must be addressed in order for mobile health application to continue to grow and deliver safe healthcare benefits.

As for operating systems, it has been discovered that 44% of doctors use the Android operating system, while 48% of patients use the iPhone operating system. Therefore, the MHA should be provided on both iPhone and Android operating systems.

Based on the observations of other countries it has been concluded that these mobile health care applications are on a rise and are exceptionally successful. Therefore, the probability of the application's success in the UAE would be high due to the success of similar applications abroad. Based on the interview findings the MSL promotion method will mostly be on word of mouth, social media, and broadcast news.

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