

M-Health Applications Use amongst Mobile Users in Dubai- UAE



Robin Kabha, Fathi Salameh, Ahmed Kamel, Moataz Elbahi, Hassan Mustafa

The report had mainly described the importance and growing trend of e-health in the modern world. The effectiveness and usability of mobile application tools and the devices have been described in the report. Moreover, different components and features of Health service for providing the facility to the patient and to maintain and manage the health sector information and data which had been described in the report. However, shortcomings and weaknesses, along with the disadvantage of mobile health application, had been illustrated in the report. The purpose and the usability of mobile application and the electronic devices for health tracking and monitoring have been provided. Moreover, the future trend and expectation of individuals and patients related to the advancement in e-health service have been described.

Keywords : E-Health Service, Mobile Application , Mobile Users , Electronic Devices.

I. INTRODUCTION

In the era of the modern and busy world, people do not get proper time for medical treatment and to visit the doctor and the physicians. The information technology has changed the dimension and the service facility of the Healthcare sector with proper management of information and the data related to the patient and other Healthcare aspects for providing better assistance and service facility. This allows in recording the details of the patient by providing decision-related to curing and treating the patients (Venot, Burgun, & Quantin, 2016). Moreover, the mobile application tools are rapidly growing in the market, which is providing instant Health Care advice and support to the patients and the individual (Omer et al., 2015). The report is mainly based on providing information and details related to the e-health service system whilst focusing on different aspects of digitalisation in the Healthcare service.

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II. RESEARCH METHODOLOGY

This research follows a quantitative methodology, where the data is collected using the questionnaire. The questionnaire consists of two parts where one part inquires the participants for individual characteristics and part two consist of the use of the mHealth applications. Quantitative methodology is used because the research aims to explore the behaviour of the participants towards mobile health. Therefore, this approach is appropriate in comparison to qualitative approach in which the natural phenomenon is explored for making deductions.

2.1 Research Aims

This study is conducted in the Dubai UAE, where there is high penetration of smartphones, along with the use of internet. Moreover, health and fitness are essential consent in the country. Furthermore, nutrition and health are a common feature of the mHealth applications and the research study conducted by the European Commission recommends that half percentage of the UAE residents use online sources for health-related information. Particularly, for diet, lifestyle, nutrition, and physical activity. Henceforth, for the wider acceptability of health services, this research aims to investigate the use of mHealth application specifically in the context of UAE Dubai.

2.2 Research Objectives

- To recognize the most commonly used mHealth application
- To identify the specific health condition for which the mHealth application is used
- to comprehend ways using which the mHealth applications can be improved
- to determine the shortcomings and problems of the mHealth applications
- to explore numerous considerations which are essential while using mHealth application

2.3 Research Significance

The extent of the mHealth sector allows fulfilling the aims of the public and individual health. Consequently, the users of the mHealth applications vary from health providers to individual parents. Henceforth, this research will contribute to better health by improving access to health care and healthcare quality. Using this research the mHealth users will recognise numerous benefits of the mHealth and its shortcomings.

This information will help in treatment support with the recognition of the mHealth application commonly used. Mobile tools like these help in decision making and record keeping, therefore the in-depth investigation of this topic will contribute to health care sector of UAE, by helping them to effectively use mHealth applications

2.4 Sample Size and Data Collection

The researchers approached 35 persons, 27 of them agreed (in writing) to participate in this study. 2 of them do not have any mHealth applications. As a result, the analysis will deal with only 25 participants. The data for this research is collected through a questionnaire. This questionnaire has been adapted from Live Well- it was conducted by the Rehabilitation Engineering Research Center for Information and Communications Technology Access (LiveWell RERC), <https://www.surveymonkey.com/r/mHealthapps>. The researchers applied major modifications to this questionnaire. In the last stage of validation of this questionnaire, it has been reviewed and approved by the “Scientific Research Committee” at Al Falah University- Dubai.

2.5 Descriptive

statistics

Descriptive statistics are the summary statistics that are used for summarizing the data in terms of brief co-efficient. Descriptive statistics represent the entire sample in a meaningful way by highlighting the sample characteristics. The most commonly used descriptive stats are variability measures of central tendency measures. Central tendency measures include meaning, median, and mode, while the variability measures are variance, standard deviation, maximum and minimum value. In this research mean, median and mode are used as central tendency measures which recognise the response of selected sample towards the research questions.

2.6 Research Demographics

Research demographics are precise features or characteristics of the representative sample. The sample of this research is classified based on numerous demographic characteristics which include designated status within university, gender, age, education level, work status, marital status, and annual income. The research demographics are either categorical or continuous. The categorical variables include gender, designation, education level, and marital status. While the continuous variables include monthly income and age group. The descriptive frequencies tool of SPSS is used for identifying the characteristics of the sample of 27 participants (see appendix 2).

In the sample of 27 participants, 55% were students, 29.6% were academic staff and 14% were from administrative staff. With respect to the gender more percentage of sample participants were male that is 74%. Besides out of the sample of 27 participants 55% were single. Moreover, 55% of the sample participants were between the ages group of 25 to 40. Concerning education level 55% were enrolled in an ongoing course or had a BA degree, while only few percent have a diploma. Sixty-three percent of the sample participants were employed.

Research Demographics		Frequency	Percent	Cumulative Percent
designation	student	15	55.6	55.6
	academic staff	8	29.6	85.2
	administrative	4	14.8	100.0
	Total	27	100.0	
gender	male	20	74.1	74.1
	female	7	25.9	100.0
	Total	27	100.0	
age	18 to 24	6	22.2	22.2
	25 to 40	15	55.6	77.8
	40 and above	6	22.2	100
	total	27	100	
Education level	diploma	2	7.4	7.4
	BA/ ongoing course	15	55.6	63.0
	MA or above	10	37.0	100.0
	Total	27	100.0	
Work status	employed	17	63.0	63.0
	unemployed	10	37.0	100.0
	Total	27	100.0	
Marital status	married	12	44.4	44.4
	single	15	55.6	100.0
	Total	27	100.0	

Table No(1)

III. LITERATURE REVIEW

Popularity has been observed in the growth of m-health services and tools. Analysts predict that the size of the worldwide mobile health market will reach US \$23 billion by the year 2017. They forecast that Europe and Asia-Pacific will have the largest markets, followed by North America. Latin America and Africa will have the smallest markets (Jihad et al., 2016). Moreover, the “World Health Organisation (WHO)” has surveyed 114 countries and concluded that various countries had adopted m-health. The establishment of the health call centers was the primary activity in this regard; which facilitated the inquiries by the patients. The appointment reminders were being provided through Short Messaging Services (SMS) to facilitate them-health services. Additionally, the provision of telemedicine, access to patient records, measurement of the compliance of the treatment, raise in health awareness, observing patients and providing support to the physician to undertake decisions (Harous et al., 2018).

3.1 What is E-Health?

The definition of e-health by “The World Health Organisation (WHO)” three basic techniques of addressing. The systems are used to disperse healthcare information to patients and clinicians via the Web or local IT. They are used to make government health programs better, such as through online training of hospital staff. The technology is used by healthcare executives to improve the operation of the organisation (Al Ketbi and Al Deen, 2018). E-Health is a new practice that is performing by the Healthcare sector with the use and the support of the electronic process and communication tool for curing and prescribing medicine to the patient. However, it is also used as a recommendation tool in the form of the mobile application by collecting details related to the symptoms of recommending medication to the patient.

E-Health is considered as it is considered as the conjunction of medical Science with information technology for intersecting the medical informatics to provide health-related services with the use of the internet and other related Technology (Eysenbach, 2001).

3.2 What is M-Health?

Healthcare providers and policymakers are the critical elements of the M-Healthcare. It provides the patients with tools to observe their health changes and converse those alterations in the healthy state to the physician of the patients. It ensures the connectivity of the health providers with their colleagues and facilitates their communication (Zubair et al., 2016). In addition, m-health also aids the physicians to access various sources of information resource. The health delivery circumstances and medical outcomes are also being evaluated and estimated by medical physicians by using them-health tools. As per the definition, any product, including accessories, used in healthcare for the diagnosis, prevention, monitoring or treatment of illness or handicap excluding drugs. Medical devices can be consumables, diagnostic imaging, dental products, orthopedic & prosthetic products, and patient aids (export.gov, 2018).

3.3 Types and Elements of E-Health

The types and the element of e-Health are of different categories, and few of them are listed below:

3.3.1 Electronic Medical Records

This assist Healthcare unit for enabling an appropriate communication related to the data of patient amongst the professionals. When performing an EMR, persistent information may include a period that is included with different health care providers. It helps distinguish people who are expected to have tests or preventive tests and to show how each patient meets their specific needs, such as immunizations and pulse measurements. The goal of EMR is to enable the association to provide useful and accurate reviews. Perhaps the most surprising difference is that EMR recordings are familiar and patients in each clinic using EMR software have electronic sketches instead of having multiple charts in multiple clinics (Gallos and Mantas, 2017).

3.3.2 M-health

This supports mobile devices which allow an individual to carry out health and medical practice. The patient can monitor and extract information with the use of mobile devices or other wireless devices (paho, 2019). Health also helps patients talk to their doctors and care groups and meet directly without getting close. For example, safe information enables physicians to expand responsible persons if their child does not receive medical treatment. Likewise, the health care provider can talk to each other about the patient, such as the caregiver, if the patient touches the basis for consultation (Samihah Zaman, 2019).

3.3.3 Health Informatics

It is a software-based supporting tool which provides a solution for managing the data of the patient, making an appointment, administrative task, and management of work schedule. The program includes computer science, choice of emotional support networks, telemedicine, morality, global healthcare computing, global health computing, translational research, and home care. It covers the fields. Scientist's ways

to plan and execute imaginative applications and develop new technologies to improve medical care (Henderson, 2019).

3.3.4 E-prescribing

This allows the Health Care unit to make prescriptions in an electronic format and transfer it to the pharmacist or the patient via electronic means with the use of the internet. In the simplest case, the structure of the electronic recipe is entered as an electronic reference manual. The progressive structure of electronic prescription acts as the author of individual resources. One can create and supplement therapies for individual patients, monitor prescriptions and display a tolerant history, interact with the pharmacy or other drug-delivery sites, and incorporate electronic patient record (EMR) structures (Mack, 2017).

3.4 Benefits of Technologies

The benefits that these technologies can bring are varied since, for decades, a person's relationship with their health was primarily a list of doctors, institutions, hospitals, and payers firmly in charge of making a decision (Gallos, 2017). Appropriate use of technology in health can improve outcomes through prevention, favouring quality and life expectancy. If these results are achieved, the need for medical care and associated costs will fall, and everyone in the health ecosystem will benefit, Cooke explains (Benharref & Serhani, 2013).

3.5 Parallel Use to Health Professional

In the UK, the analyst doctor of the UK, Tobias Engel uses and recommends an application in his consultations. Through the app in their clinic, they have been able to solve timely and straightforward patient doubts, which in the vast majority of them can be answered via email or telephone, thus helping the doctor-patient approach. Already in the most complex doubts or in cases of alert, they have been able to guide him to go to the emergency room (Venot et al., 2016).

That is, despite the day-to-day facilities, such technologies must be used in parallel with real and face-to-face health care. It is important to note that applications do not replace consultation and guidance from a professional, such as a doctor or nutritionist. Also, it is necessary to check with caution the source and reliability of the information offered by this app, guides Fortes (Alloghani, et al., 2015).

With the increasing progress of these technologies, those who are able to combine health and connectivity, see the concern that people are having more focused on improving their living habits, only tends to win, including companies that have already seen this advance in favour of their patients and clients, seeking health care, information and holistic well-being. Any entity that chooses to ignore these technological developments runs the risk of becoming obsolete. Research shows that there is a tremendous opportunity for health technology waiting to be explored, and with it, the potential to revolutionise patient care said Jennifer Carrea, CEO of Light speed Americas (Al Ketbi & Al Deen, 2018).

Terms such as artificial intelligence, machine learning, and predictive analytics are increasingly common in the health world.

HealthTechs' investments in the development of devices that enable better management of people's health, especially medical information of individuals, are also growing worldwide (Paho, 2019).

However, despite this, data from an analysis conducted by Kantar in the United States on the health technology situation indicate that only 30% of American physicians have already recommended health and wellness or wearables apps to their patients (Alloghani, et al., 2015).

On the user side, the perception is different. Almost half of Americans surveyed understand the positive use of technology for health. The study integrated information from several surveys conducted by the Institute last year (Samihah, 2019).

3.6 Service-Oriented and Cloud-Based e-health System (SOCBeS)

In regards to offering electronic healthcare services; "Service-Oriented and Cloud-Based e-health System (SOCBeS)" were being introduced for the prevention and monitoring the chronic diseases and to promote the reduction of their influence. The "Service Oriented Architecture (SOA)" are the systems on whose standards the (SOCBeS) are being built upon. Utilising (SOCBeS) in the healthcare industry could contribute a lot in the provision of excessive storage solutions to store patients' medical records, its organisation and management. With the help of (SOCBeS) the healthcare centres can provide cost-friendly, rapid, trustworthy, scalable and on-time services to their patients. (SOCBeS) enforce the timely semi-automated data collection through "fly monitoring and taking proactive measures to identify risk factors and prevent the subject from unfortunate severe health consequences" (Harous et al., 2018).

This system can be utilised for three essential assistance such as early diagnosis of cardiovascular diseases, keeping a follow up with the patients diagnosed by cardiovascular disease and train the patients to prevent the occurrence of cardiovascular diseases and related disorders. In addition, essential physiopathology measures are being collected by the involvement of "sensing technologies" along with communication-based structures. SOCBeS services cater to the sensory data collection, its refinement, and deriving intellectual verdicts from it (Henderson, 2019).

In this regard, the investment and development of ICT structures for interlinking "hospitals, clinics, healthcare organisations, patients, and professionals so that the exchange of medical data" can prevail, along with the accurate and trustworthy data supply (Gallos and Mantas, 2017). Also, the contribution of the wearable body sensors cannot be neglected as their incredible ability to sense and evaluating the health parameters with exactitude (Harous et al., 2018).

3.7 Emergence of E-health in UAE

According to the news report article of Khaleej time and other sources, UAE is implementing digital technology in the Healthcare sector for making the Health Care unit more advanced in the digital world. E-health is gaining importance in UAE, and the nation wants to act as a catalyst in the context of integrating digital technology in the health sector. UAE has launched several mobile applications and wearable

Healthcare devices for providing a better solution for the health-related challenges (Clarke, 2015). UAE is emphasising more implementing technology in the Healthcare sector to enhance its facility of Healthcare services by using electronic means and digital media (Harous et al., 2018).

3.8 Mobile Health Applications in UAE

MyMedicNow is the healthcare application that has been recently introduced in the UAE to assist in associating patients and physicians. Assistance in looking for medical conditions along with helping patients in finding "local healthcare providers". According to the founders of MyMedicNow: "The launch is timely as UAE's mobile health industry is positioned for a robust growth" (TradeArabia.com, 2019). They further added: "The Global Mobile Health (mHealth) Market is poised to grow at a CAGR of around 33.8 per cent over the next decade to hit \$181.52 billion by 2025, it stated, citing a report by Research2Guidance Annual m-health – 2016" (TradeArabia.com, 2019). This m-health application allows the patient to connect with the precise physicians by assisting them to search the symptoms of the disease or disorder through an exclusive methodology. This newly introduced application help the patient in searching for adequate doctors by looking for the medical condition and to locate the nearby or local healthcare practitioner efficiently. IOS, Android and web portal are the only portals facilitating the m-health application currently (Gallos and Mantas, 2017).

Dhaval Desai, CEO of MyMedicNow, stated: From life-saving medications to cutting-edge treatments, the healthcare industry thrives on constant innovation. However, the biggest recent breakthrough in healthcare is the smartphone and its applications (Henderson, 2019). Henderson, (2019), continued by saying, "there's an app for everything, but the best ones are the apps that will get the person out of a bind when emergency strikes. MyMedicNow abounds with convenient solutions that not only help improve people's lives but also helps make informed choices easier and faster whilst ensuring doctors and hospitals are better connected to patients" (Samihah Zaman, 2019).

Around two-thirds of the worldly population has found to have a mobile connection and to please the emerging mobile health industry, individuals are engaged in maintaining their health issues by using their mobile phones for better gauging the symptoms in an ever-innovative way (Bodolica and Spraggon, 2019). According to a review proposed in the research2guidance, (2019), almost 100,000 health-related apps have been added by 13,000 new publishers to the market since 2015 (Harous et al., 2018). At that moment, there had already been 259,000 medical apps in major app stores. With the term "healthcare application", the people generally assume that it would be a health/fitness tracker, but these applications are much more than only being a fitness tracker. Smartphones are an easily accessible gadget, and this has contributed not only to the mobile sector but also a significant driver of the healthcare industry (Zubair et al., 2016).

3.9 Accessibility of the Applications

In the era of modern technology and the smart world, these applications are easily accessible for smartphone users on application stores. In the context of usability, the applications are programmed and design with a user-friendly approach so that it can be convenient for every person to use the application (Al Ketbi and Al Deen, 2018). However, the application comes with an electronic user guide manual which is also useful in guiding the new user in terms of operating the application. The co-founder of the Pulse Middle East reported that “The UAE has incredibly high smartphone penetration, which affects how residents in the UAE consume digital media and applications” (Khaleej Times, 2019). In addition, they reported that this application had been downloaded by 40,000 individuals with a panel of 4000 doctors on-board within the first quarter after its launch. The number of downloads was being marked as a high turnover of people by the founders of the MyMedicNow application (Henderson, 2019).

The downloading of an application by a user is half of the race completed. The downloading and then immediate deletion of the application after using was recorded as 25%, and 77% deletion of the application was being observed within 72 hours after their installation (Khaleej Times, 2019). It usually depends on the scope of the application and its almost one out of four applications are capable of actually engaging the users. The doctors registered themselves on the application as the application facilitated the need of the middle man, and now the doctor and the physician can connect directly. Thus, communication between the doctor and patients has become convenient (Paho, 2019).

Both the federal and emirate levels in the UAE has regulated healthcare. “Federal-level legislation dates back to the 1970s and 1980s, and there are pending legislative reform initiatives to facilitate the development of the healthcare industry. The U.A.E. Government is liberalising policies to attract foreign investments to improve the healthcare standard and boost the healthcare industry” (export.gov, 2018).

3.10 Purpose of such Applications and Devices

In the modern civilised world, people become very busy with their daily schedule and activity, and they do not get proper time for a health check-up. In addition to that, there are several regions where accessing medication facility in an emergency is very hard due to the distance barrier. The formulation and implementation of a high-class infrastructure to facilitate the healthcare sector has become the primary concern of the Government of the United Arab Emirates (UAE). The consequences of these efforts have turned the U.A.E. suffers from a shortage of trained medical personnel. There are many hospital construction and renovation programs underway as a result of public and private investment. “A growing medical tourism sector is generating demand for modern facilities with state-of-the-art medical equipment. Medical device production will continue to below, and only limited to basic items such as various types of syringes, and IV sets will be locally produced” (Export.gov, 2018). This sector is an advanced and modernised sector during the past few years.

In the age of modern technology, the internet has played a

vital role in providing Healthcare assistance to individuals and patients. This applications and devices are program and design for regular use to monitor and detect the fundamental health issues. This will allow patients and the individual to track their health-related issues daily so that they can take proper medication and medical assistance at the proper time without getting failed (Mack, 2017). In addition to that, small issues can create unconsciousness amongst the individual, and it will create a state of tension amongst the family members (Benharref & Serhani, 2014). Mobile-based application tools and the devices provide a convenient medium to identify the issues related to health, and it is also useful to act on health issues for self-treatment. Moreover, the application also allows consulting with the doctor via video conference or through chat for taking doctor’s recommendation and advice (Venot, et al., 2016).

3.11 Shortcomings, Weaknesses and Disadvantages of these Applications

Faced with application flaws, all mobile-based tools do not provide an accurate answer for the patient. The application tool can only alleviate fundamental well-being issues. In addition, it is ridiculous always to win experts for the application. According to the application error, the application means that mobile-based, mobile-based, health-based application tools do not work with mobile and non-mobile customers. However, most application tools are English-language and will be very difficult for the general population that does not speak English (Craig, Usama, Fawzi, 2014). Non-technical persons believe that their application is difficult to process due to their low complexity (Gallos and Mantas, 2017).

In terms of defects, application tools provide no permanent and ongoing help. However, it is not expected that infections or severe disorders will determine a suitable proposition. The application is not effective in providing all the Healthcare related services, and people often find it unworthy of using mobile application for accessing the health care services facility (ALKRAJJI, Osama, & Fawzi, 2014). The virtual interaction is not enough for providing a better solution to cure any disease or health-related issue. Additionally, despite the fact of the modernisation of the world and the availability of the mobile healthcare applications; the need for gauging the acceptance of the individual toward the mobile health application whilst considering their healthcare issues remains a questionable concern (Harous et al., 2018).

Blockchain technology has evolved so far and faces social problems such as social movements and the technical issues described above. It is never easy to accept and apply a completely different approach than traditional business approaches. Even though the healthcare industry is becoming increasingly digital, everything needs to be tested to make a full transition to this technology. In particular, clinical aspects, such as Blockchain need to be reviewed (Benharref & Serhani, 2013). It takes time and effort to convince professionals to move from paperwork to technology.

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Due to low reception rates in healthcare, the technologies and policies provided are relatively unreliable. Faced with these challenges and threats, they are not yet a viable and universal answer to all health problems. A SWOT follow-up approach has been implemented to understand, investigate and identify the strengths, weaknesses, opportunities and threats of health blockages (Al Ketbi and Al Deen, 2018).



Figure No (1)

3.12 Expectation Regarding the Future Trend and Invention of Healthcare Sector

A lot of technology industries and the health care units are working collaboratively for bringing more advancement in the sector of digital Healthcare. The current market is booming with the use of digital Healthcare devices and mobile application tools for getting instant help and support related to health care issues (Al Ketbi and Al Deen, 2018). Apart from that, mobile application tools are not efficient and competent enough to fulfil the expectation of users and patients. The technology industries and the Healthcare sectors are giving more effort to leverage the service facility of the Healthcare sector with the use of digital technology (Mack, 2017).

IV. RESULTS AND DISCUSSION

4.1 Analysis of the mHealth apps used

This section inquired the participants about the mobile apps used by them, specifically the apps that are used for health monitoring and management. In the first question of part 2, the participants were asked about the device used for running the mobile application. In response to this question more percentage of the sample used apple iPhone.

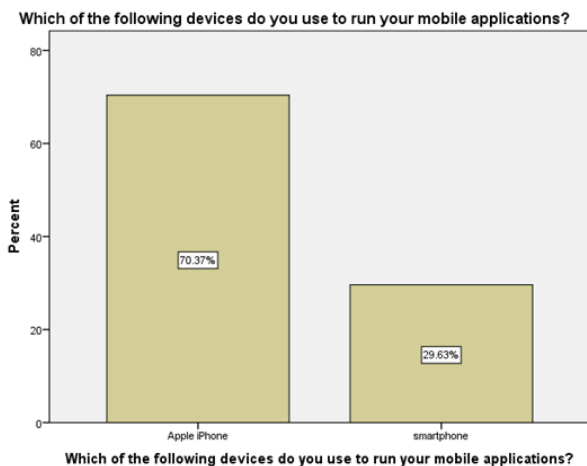


Figure No(2)

In question two the participants were asked about how many different mobile applications are installed on their mobile devices. Concerning this, 77% of the sample participants have 5 or fewer types of applications downloaded on their mobile devices.

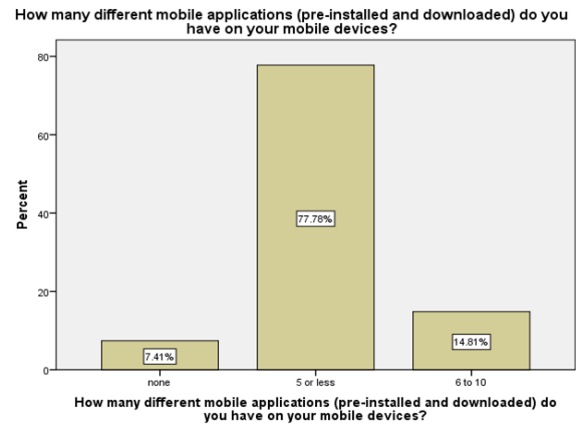


Figure No (3)

As the purpose of this research is to analyse the use of mHealth applications within the Dubai population. The selected sample was asked about whether they use mHealth application, as a result 70% of the sample use mHealth app on regular basis while only 22% use it irregularly. This means most percentages of the individuals use the app on daily basis.

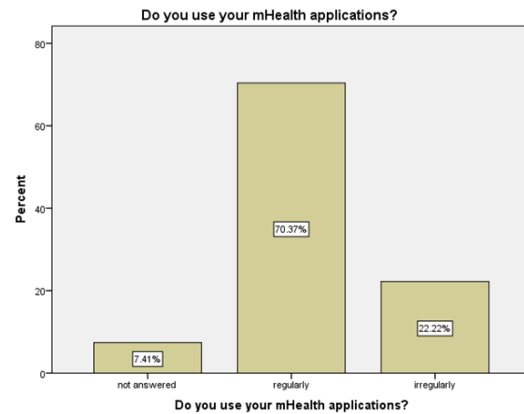


Figure No(4)

In addition, the research sample identified that it is easy for them to find the most relevant application that will work well for them. Moreover, 92% of the sample said these applications are free of cost and they do not pay for using them.

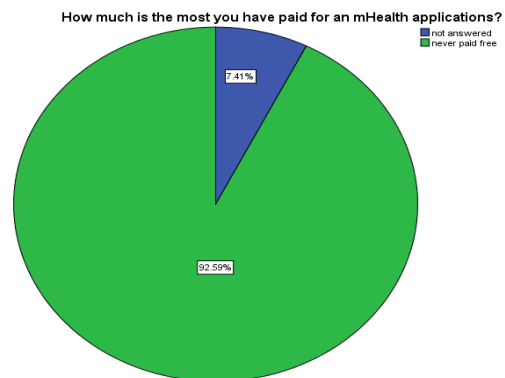


Figure No (5)

How easy or difficult was it for you to find mHealth applications that work well for you?

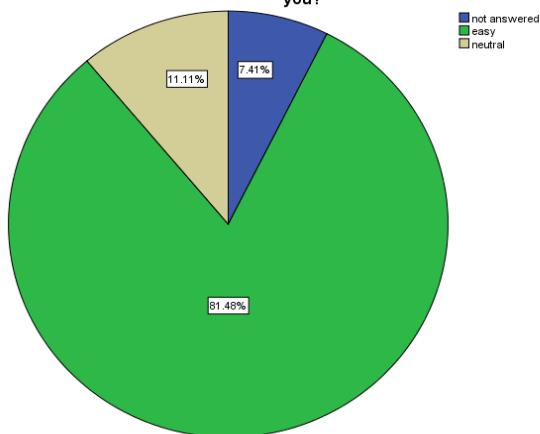


Figure No (6)

Which of the following types of health applications do you use	
Fitness	22
diet	23
Lifestyle	23
Communication	25

Table No (2)

The sample of 27 individuals said they use all types of health applications. More than 20 individual's use all type of heal applications that is fitness, diet, lifestyle, and communication.

Moreover, individuals were asked if they use applications for managing the following health conditions. The most common health condition was medication management or health management reminders.

Do you use any applications that help you managing specifically one of the following health conditions?	
obesity	3
Diabetes	5
Heart and circulatory conditions, including blood pressure	6
Women's health and pregnancy	6
Medication management or reminders	13

Table No (3)

Furthermore, for finding the mHealth app, the sample mostly used an app store or built-in app installed in mobile.

Which of the following resources did you rely on to find mHealth apps that work for you?	
App store	18
Built-in app installed in mobile	12
Recommended or prescribed	5

Table No (4)

4.1.2 Satisfaction with the mHealth Applications

In addition to the use of mHealth application, it is necessary to explore if the Dubai individuals are satisfied with the mobile health application they use and whether they are

effective in managing the health. This study recognised that more percentage of the sample is satisfied with the application they use. But 11% of the sample was also dissatisfied with the health management applications

In general, how satisfied are you with the use of these applications to manage your health, either for wellness or for specific condition?

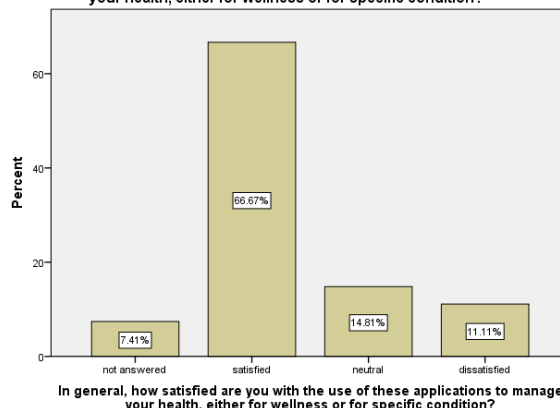


Figure No(7)

4.1.3 Improving the mHealth Applications

In order to increase the percentage of the individuals that use mHealth applications, it is essential to improve the applications so that these are convenient to use. For this purpose the study sample was asked whether they require a website that provides feedback or review by the users with similar conditions. For this question 70% of the sample participants said that the website with feedback will be helpful for them and they will for sure use it.

Would it be helpful to have a website that provides review or feedback about applications from users with conditions like your own?

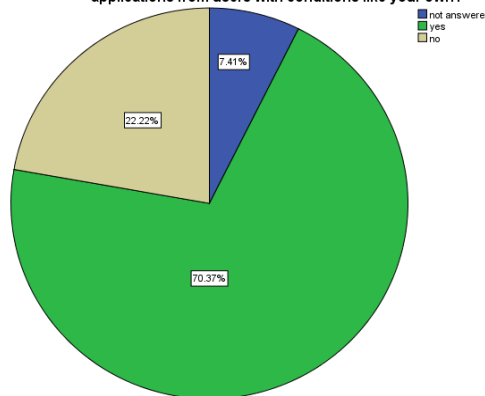


Figure No(8)

Abbreviations and Acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

4.1.4 Problems and Shortcoming While Using mHealth Applications

In this research, the sample was also inquired about the particular problems they face while using the mHealth applications. Numerous problems were recognised such as ignorance and irregularity, complexity, accuracy and sudden device problems.

The most common problem as per this research is ignorance and irregularity. Furthermore, 25% said that identifying the app with accuracy in accordance with the condition is another problem.

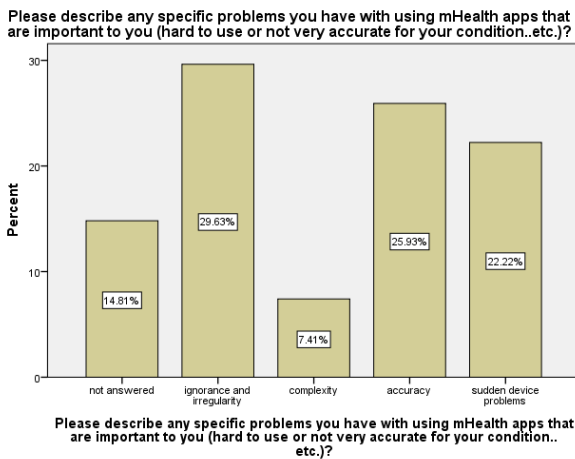


Figure No(9)

4.1.5 Important Considerations When Using mHealth Application

The sample individuals were asked about what are the few things to consider when using mHealth applications. In response to this question, the 25 individuals said that considerations like easy to set up, easy to use and overall effectiveness are important.

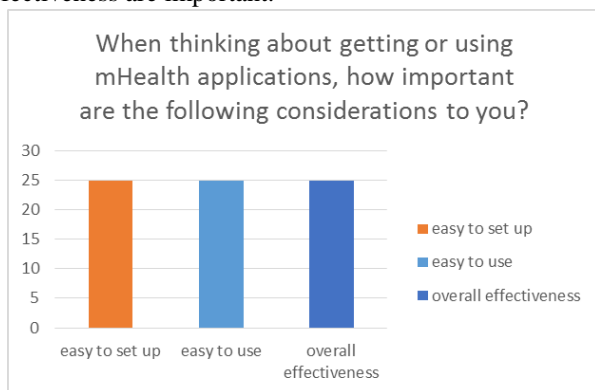


Figure No (10)

4.1.6 Using mHealth For Medical Help and Health Emergency

In case of a health emergency, most of the participants of this Dubai said they want mHealth applications to alert them for seeking medical help. Moreover, they also said that they want their health professional to access the data from mobile or home health device this will help in managing the health. Besides, for effectiveness of the apps the sample was asked whether they want to connect their peers having same conditions using the mHealth apps. However, in response to this question more percentage of the participants denied connecting with peers having similar types of conditions.

Would you want your mHealth applications to alert you to seek medical help if you might be having a health emergency?		Frequency	Percent
Valid	not answered	2	7.4
	yes	23	85.2
	no	2	7.4
	Total	27	100.0

Table No (5)

Would you want your doctor to have access to data from your mobile or home health device?		Frequency	Percent
Valid	not answered	2	7.4
	yes	19	70.4
	no	6	22.2
	Total	27	100.0

Table No (6)

Would you want your mHealth apps to allow you to connect with peers with the same condition?		Frequency	Percent
Valid	not answered	2	7.4
	yes	6	22.2
	no	19	70.4
	Total	27	100.0

Table No (7)

4.17 Correlation between Uses Of mHealth App and Research Demographics

Correlation analysis is the technique for evaluation that measures the statistical association amongst the research variables. This shows if the selected variables are weakly, moderately or strongly related. The value of Pearson correlation lies between the intervals of +1 to -1, where a zero value depicts no effect. If the Pearson correlation value is closer to -1, this means a negative correlation, while if the value is more close to +1, then the variables are positively associated. However, it is essential to check the association for its significance. If the value of significance is less than 5%, this means the correlation is significant. In this research, the correlation coefficients are estimated between demographic variables and the use of mHealth applications. Here only designation, gender, and age have a positive and significant correlations with the value lower than 5%. This shows that there are differences in the individuals based on designated positions for using mHealth application. Moreover, there are differences among both genders with respect to the use of mHealth application. Furthermore, the use of mHealth applications is different among individuals of different ages.

Correlations	Do you use your mHealth applications?
designation	Pearson Correlation: .543** Sig. (2-tailed): .003 N: 27
gender	Pearson Correlation: .639** Sig. (2-tailed): .000 N: 27
age	Pearson Correlation: .636** Sig. (2-tailed): .000 N: 27
education level	Pearson Correlation: .333

	Sig. (2-tailed)	.089
	N	27
work status	Pearson Correlation	.369
	Sig. (2-tailed)	.058
	N	27
marital status	Pearson Correlation	.253
	Sig. (2-tailed)	.203
	N	27
	Sig. (2-tailed)	
	N	27

Table No (8)

4.2 Current Trends in UAE

An alarming state of growth in chronic diseases has been observed in the world, specifically in the UAE. The UAE Ministry of health published statistics which proposed that 25% of deaths were binge observed in the country due to the chronic diseases (Benharref and Serhani, 2013); more particularly the cardiovascular diseases (Samihah Zaman, 2019). Moreover, substantial divergent factors, inclusive of “cholesterol, diabetes, high blood pressure, physical inactivity, smoking, overweight and obesity”; but not only these specifically (Harous et al., 2018). To cater this increase in the morbidities by these chronic diseases and the related impediments specially formulated and well-organised monitoring and “monitoring and prevention approaches” could aid in the risk-taking of the occurrence of these diseases by eliminating the critical causes of the cardiovascular diseases (Zubair et al., 2016).

The advances in the healthcare systems have triggered the convergence of the prior mortal diseases into chronic diseases now. This has assisted in fulfilling the demand if r continuous care, especially in the cases of older adults (Benharref & Serhani, 2013). “In terms of medical devices, the U.A.E. is an import driven market that is proliferating to keep pace with the country’s expanding healthcare infrastructure. The government and private healthcare sector are investing heavily to provide countrywide healthcare solutions to the residents, expats, and medical tourists. Orthopedic devices are expected to register the highest growth, specifically due to the aging population” (Export.gov, 2018).

However, the over-growing expenses for both the patients and the caretakers are leading to an extent that may cause the scarcity of the e-healthcare services. In this regard, the evolving tradition of the e-healthcare services assists the patients and the healthcare providers’ inconvenient access to critical health information anywhere and anytime (Paho, 2019).

Increasingly popular with people, health applications have been growing at the same rate as technological advancement: since 2015, the use of these apps has increased by 25%, according to a recent survey by Kantar (Mack, 2017). And not only through smartphones, but also through dressing technologies: so-called wearable gadgets, which grew by 12.3% in American consumption - today 21% of adults in the United States report having a mHealth for monitoring their health (Henderson, 2019).

4.3 Electronic Health System

In 2008, the Ministry of Health of the United Arab Emirates launched Wareed, an electronic health information

system that connects the Ministry of Health of Dubai with all hospitals and clinics in the United Arab Emirates for all purposes (Eysenbach, 2001). This system provides a centralised platform for storing patient information and enables physicians to access the patient’s history and other important information quickly. Each patient in the system has a unique identifier that allows them to access their medical records and use the system to contact their family doctor for an online interview. Wareed has many excellent technical resources. For example, a network of mental health experts inherently reduces medical errors, prevents the reoccurrence of prescription drugs, and improves safety and health efficiency in many ways (Mack, 2017).

In Dubai, multiple m-health providers have recently partnered with the NMC Healthcare Emergency Clinic to implement electronic storage and exchange of medical records using Blockchain technology. This technology is expected to ensure data integrity, security and reliability in the sharing of patient information between health professionals and patients as early as the beta phase. This is part of the government’s vision to block government documents by 2020 (Gallos, 2017). If the United Arab Emirates can develop a global electronic health care system, they should consider federal data protection laws that contain specific provisions for personal health information. This law provides for international best practices, including the collection of personal data specifically for specific legitimate purposes, including access to data and the request for correction if the information is incomplete or inaccurate. Exercise should be reflected (Jihad et al., 2016).

Electronic health is not just privacy. Whether it is an electronic product or another health product, there is generally a contract for the sale of the product and the provision of the product or service, and the Commercial Code is likely to provide a reason for the dispute to be resolved (Jihad et al., 2016). When electronic health products are sold as consumer goods, consumer protection laws and their guarantees can protect against defective products or defective products. Issues such as drawbacks, inadequate explanations, and harmonisation of standards, violations of adjacent licensing requirements (including regulatory approvals for medical devices or regulatory approvals that block telecommunications) are just a few of the other types. Examples are legal issues related to electronic medical devices and facilities may occur (Gallos, 2017).

V. CONCLUSION

After conducting the research, it has been analysed that, digitalisation in the health sector and m-health is getting much importance in the present world with proper management of data and information related to the Healthcare services and providing better service facilities. Moreover, the mobile applications and the tools are practical in terms of tracking and monitoring the daily activities, and digital devices are pretty much effective in providing information on health-related issues.

The application and the tools are designed with a user-friendly approach, and it can be accessed easily. The adaptation of these resources will aid the government in reducing their burden of the healthcare units by engaging patients in availing services by using mobile-based healthcare services. The promotion and training of the significance and use of these services can assist the individuals to make most of these applications by staying up at home and connecting to the doctor without making many efforts. The emergence of m-health services has triggered to the feasibility of the people by attaining the services of the internet-based clinical practitioners.

The survey results highlighted that a higher percentage of the individuals in Dubai utilise mHealth application that is in the sample of 27 participants 70% use mHealth regularly. This shows that mHealth is gaining recognition and acceptability in Dubai. Furthermore, the sample participants considered that mHealth apps are more convenient, easy to use and free of cost as these are built-in on mobile or available on the app store. Concerning the type of health applications mostly used in Dubai fitness, diet. Lifestyle and communication are more commonly used. Besides medication management and reminders are the major concerns due to which the mHealth applications are used. The sample of UAE individuals is highly satisfied with mobile applications.

Medical technology includes home medical devices and medical home information technology. The four recommendations in this area relate to (i) the regulation of health technology, (ii) the development of guidelines on the structure and usability of health information technology, and (iii) the development of guidelines. Moreover, standards for the labeling of medical devices. (iv) Improve the system for reporting adverse events on medical devices. Receiving these recommendations improves the comfort and effectiveness of technology systems and devices, and helps users to understand and learn how to use them. The growing importance of using healthcare technology is a predictable challenge for some frequent users, especially those with inadequate training, cognitive impairment, or limited technical knowledge. For example, telemedicine management is more effective if it is compatible with the technology. For this purpose, several eHealth applications have been developed.

5.1 Solutions and Recommendations

Although the mHealth applications are widely accepted by the Dubai individuals, the participants also identified numerous problems they faced while using the app. The common problem includes ignorance, irregularity, complexity, accuracy and sudden problems in device. However, the problems highlighted by participants are not majorly related to the functioning of the applications. These problems are subjective such as the ignorance and irregularity in use means the participants do not use it on daily basis may be due to less time. Although, the accuracy and complexity are problems relating to the application. Accuracy means the sample has difficulty in using the applications because its features are complex. Therefore this is suggested that mHealth applications feature must be modified for improved user interface so that individuals can use it without difficulty.

Furthermore, in relation to accuracy, the participants face difficulty to recognise the suitable application related to their medical condition, for which the mHealth applications must be changed to include more information relating to its use for specific health conditions. In addition, considering these problems the sample participants highlighted that there must be a website which consists of the reviews and feedback of the users with similar condition. This feedback will help individuals in identifying the application according to their needs. When using mHealth application the individuals keep in mind accessibility, overall effectiveness, easy to set up and easy to use. Therefore, the mHealth applications must be analysed for the availability of these features for wider acceptability.

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