A Study on The Usage of M-Health Apps

Anu Grace Sam[1], K. Nithya[2] & R. Murali Krishnan[3]

[1] Commerce Teacher, Sindhi Model Senior Secondary School, Kilpauk, Chennai - 44

[2] Assistant Professor, Department of Banking And Insurance Management, SDNB Vaishnav College For Women (Autonomous), Chennai

[3] Assistant Professor, Department of Business Administration, Swami Dayananda College Of Arts & Science, Manjakudi, Thiruvarur Dt, Tamilnadu.

Email: Nithyapu@gmail.com

ABSTRACT

M-Health has successfully revolutionized the traditional healthcare delivery allowing the large segment of people to access quick facility with connected mobile device especially in large countries. At this juncture, the study on diffusion of M-Health apps on smartphone users is of great importance to the customers and marketers. The emotional decision making takes an upper hand for using health apps. The present study is carried out to understand the psychological thought process that goes behind the minds of the consumers while using a health app. Consumers are not driven by rational thinking but by emotional desires like connected care between Doctor's office visits, reduce own healthcare costs, convenient access to providers and ability to obtain information at any time. With the rise of M-Health apps, the future of healthcare industry looks even more expanded and the opportunities available are numerous.

KEY WORDS: M Health, Apps, Healthcare, Mobile Technology.

INTRODUCTION

A healthy nation is a wealthy nation. A nation's wealth or wellbeing is directly related with the people with sound mind and health. Healthcare is important to the society because people get ill. Accidents, emergencies do arise where hospitals are needed to diagnose, treat and manage different types of ailments and diseases. There is also the prevalence of eating disorder among adolescent girls (Hemalatha J et.al, 2021). With respect to mental health, the Covid-19 pandemic has also created disruption in the psychological and emotional mind-set (Lalitha D &Anitha T, 2021). People's aspirations and desires cannot be met without longer, healthier and happy lives. The healthcare industry would continue to thrive and grow as long as man exists in this world. Mobile technology has changed lives of millions of people. The major advantage of mobile technology is that it allows a computer device not to be connected to any fixed physical connection. Smartphones have become a common device in healthcare environments that drive fast growth in the development of M-Health applications. The healthcare 3.0 is

the blend of technology and human touch. The mobile apps are the foundation for healthcare 3.0 in India and all over the world. At present, the usage of Mobile apps, Telemedicine became inevitable in the time of catastrophe like COVID -19 situation around the world.

REVIEW OF LITERATURE

The use of Personal Digital Assistance (PDA) among personnel and students in health care industry in North-America was studied. The content analysis coincided to a certain extent to Nielsen's Model of System Acceptability (social and practical acceptability), including usefulness (utility and usability) and subcategories such as learnability, efficiency, errors and satisfaction. The study showed some evidence that the use of a PDA in health care settings might improve decision-making, reduce the numbers of medical errors and enhance learning for both students and professionals (**Lindquist A. M. et.al, 2008**). SMS supported interventions for prevention, surveillance, management and treatment compliance of communicable and non-communicable diseases such as HIV/AIDS in developing countries like India, South Africa and Kenya were analysed. The study examined both peer-reviewed and grey literature reporting of 98 applications that fulfilled the inclusion criteria (33 prevention, 19 surveillance, 29 disease management and 17 patient compliance applications). The SMS applications were evaluated and were well accepted by the population. It found that mobile phones are an appropriate and promising tool for disease control interventions in developing countries (**Déglise C.et.al, 2012**). The applications for mobile devices exclusively dedicated to the eight most prevalent health conditions based on Global Burden of Disease (GBD) report by WHO was studied. It found that for conditions such as diabetes and depression, an overwhelming number of health apps are available and there were lack of apps related to other conditions such as anaemia, hearing loss, or low vision etc (**Martínez-Pérez B. et.al, 2013**).

Consumers' Personal Innovativeness towardsMobile Services (PIMS), perceived health conditions, health care availability, health care utilization, demographics and socioeconomic status affect theirM-Health usage intentions, extent of M-Health assimilation and preference for M-Health as a complement or substitute for in-person doctor visits was examined. Data was collected from 1132 nationally representative US consumers and the findings contributed to the health informatics literature and to health policy initiatives by demonstrating that M-Health will face both acceptance and resistance (**Rai A. et.al, 2013**). The extent to which diet apps content was guided by health behaviour theory in their design and user interface was evaluated. The study examined 58 diet apps from iTunes Health & Fitness category. Scores ranged from 0 to 26 on a 100-point scale were given. Most apps were theory deficient and provided just general information and assistance. Hence, an opportunity was available for health

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experts to partner with app developers to incorporate health behaviour theories by individually tailored apps (**West Joshua et.al, 2013**).

The study provided recommendations on the use of mobile computing and communication technology in health care and public health. The study included parameters such as interventions designed to improvediagnosis, investigation, treatment, monitoring and management of disease, interventions to deliver treatment or disease management programmes to patients, health promotion interventions, interventions designed to improve treatment compliance and interventions to improve health care processes like appointment attendance, result notification, vaccination reminders etc (**Free C. et.al, 2013**).The impact of mobile phones on health and in identifying the main areas of health care delivery where mobile technologies can have an impact was evaluated. The outcome measures used in the studies were mostly clinical, including both self-reported and objective measures. Results showed that research interest in m-Health was growing together with an increasing complexity in research designs and aim specifications, as well as a diversification of the impact areas (**Fiordelli M et.al, 2013**).

Different kinds of risks that medical apps can contribute and important contextual variables that can modify these risks were evaluated. They also developed a simple generic risk framework that app users, developers and other stakeholders can use to assess the likely risks posed by a specific app in a specific context. The study found that it can help app commissioners, developers and users to manage risks and improve patient safety (**Lewis T. L. & Wyatt J. C., 2014**). The study analysed the top two hundred health apps at the App Store from a developers' perspective to provide a focused overview of the status and trends of operating systems and an analysis of related technology, architecture and user interface design issues. The apps were classified into different groups according to their purposes, functions and user satisfaction. Results found that M-health apps still had plenty of room to grow to take full advantage of unique mobile platform features and truly fulfil their potential. In particular, introduction of two or three dimensional visualization and context-awareness could further enhance m-health apps usability and utility (**Liu Chang et.al, 2014**).

A study of current practices and recommendations for designing, implementing and evaluating m-Health technologies to support the management of chronic conditions in community dwelling older adults was conducted. A 5-stage scoping review methodology was used to map the relevant literature. Results found that there was limited yet increasing use of m-Health technologies in home health care for older adults. Auser-centred, collaborative, interdisciplinary approach to enhance feasibility, acceptability and usability of m-Health innovations was imperative in this hour (**Matthew-Maich N. et.al, 2015**). The

Study addressed the role of mental health educators and professionals in the diffusion of mental health mobile apps. Evidencebased mental health mobile apps were relevant and beneficial for psycho education, patient empowerment and for helping patients reach therapeutic goals. Also infusing mental health mobile apps into education and practice will help bring about diffusion of these innovations throughout the mental health social system **(East M &Havard B**., **2015).**The extent to which socio demographic, social determinants and electronic device use influences eHealth literacy and use of Web 2.0 for health information among baby boomers and older adults were explored. The study found that almost 90% of older Web 2.0 users reported using popular Web 2.0 websites such as Facebook and Twitter to find and share health information **(Tennant B., 2015)**.

The study developed a reliable, multidimensional measure for trialling, classifying and rating the quality of mobile health apps using 372 explicit criteria for assessing web or app quality that were extracted from 25 published papers, conference proceedings and internet resources **(Stoyanov S. R. et.al, 2015)**. An overview of m-Health apps offered on iOS and Android with a special focus on potential damage to users through information security and privacy infringements was established. They also assessed apps available in English and offered in the categories "Medical" and "Health & Fitness" in the iOS and Android App Stores. Based on the information retrievable from the app stores, they established an overview that various kinds of m-Health apps collect and offer critical, sensitive, private medical information, calling for a special focus on information security and privacy of m-Health apps **(Dehling T. et.al., 2015)**. The study evaluated the presence of health behaviour theory in calorie counting apps. Data for this study came from an extensive content analysis of the 10 most popular calorie counting apps in the Health & Fitness category of the Apple App Store. The study found that most of the calorie counting apps in the sample contained minimal health behaviour theory **(Davis S. F. et.al, 2016)**.

The study found evidence that apps can help patients in reaching their health and fitness goals. The study also suggested the features to be looked in an app and reviewed popular health and fitness apps. Results showed that health and fitness applications contain a wealth of behaviour change techniques typically used in clinical behavioural interventions and may represent a medium by which these interventions could be translated for widespread use (**Higgins J. P., 2016**). The study qualitatively determined the design and content elements of health apps that facilitate or impede usage from the users' perceptive. The participants were asked about their general and health specific mobile app usage and inductive thematic analysis was adopted to analyse the data. The findings provide researchers, app designers and health care providers insights on how to develop and evaluate health apps from the users' perspective (**Peng W.et.al, 2016**). An in-depth security and privacy analysis of some of the most popular freeware

mobile health applications were evaluated. Both static and dynamic analyses of selected mobile health applications, along with tailored testing of each applications' functionalities were made. The findings

revealed that the majority of the analysed applications did not follow well-known practices and guidelines, not even legal restrictions imposed by contemporary data protection regulations, thus, jeopardizing the privacy of millions of users (**PapageorgiouA.et.al, 2017**).

The trend, opportunities and challenges of m-Health apps by making a survey of published academic literature and a survey of existing m-Health applications on Google Play were studied. It addressed the current state of m-Health apps' research and development, starting from its current trend towards challenges. Evidence showed that many of available m-Health apps on the market were not grounded in theory and found m-Health apps were not able to provide great clinical impact on users (**JusohShaidah, 2017**).The study analysed the relevance of m-Health apps in the working context. Findings from the study gave recommendations fororganizations that were planning to provide m-Health apps to their workers and for developers of m-Health apps that included system performance influences adoption and adherence, relevancy and benefits of how the m-Health app should be clear to the user and should address users' characteristics, app should take into account the work context andemployees should be alerted to their right to privacy and use of personal data (**De Korte E. M. et.al, 2018**).

In the Indian context, e-Health systems developed for Indian healthcare sector were examined by performing a content-based analysis technique. The study had identified and highlighted few challenges, opportunities and gaps related to e-Health systems that would be applied for system development in near future so that more reliable, user oriented and demand specific systems could be invented in near future (**Sharma P. et.al, 2016**).

STATEMENT OF THE PROBLEM

With continuous development of technology, the possibility of m-Health applications and digital physicians providing personalized service or attention to a user or patient is greater. The term 'm-Health' refers to clinical and public health activities involving mobile devices such as smartphones. M-Health is important because it makes healthcare practices accessible to the public through mobile communication technologies in a variety of ways like providing healthcare information, collecting health data, observing patients, etc. It offers health related services which are accessible to patients both at home and outside in a single click. At present, its usage became inevitable in the time of catastrophe like COVID -19 situation around the world, where physical contact and examination pave way for further spreading of the disease. Hence, the present study entitled **"A STUDY ON THE USAGE OF M-HEALTH APPS"** has been

conducted to understand the level of awareness, its usage, inducement and impact of m-Health apps on consumers' self-management of health.

OBJECTIVES OF THE STUDY

The following are the objectives of the study:

1. To check the level of awareness of m-Health apps among its users.
2. To analyse the impact of m-Health apps on users self-management.
3. To find the usefulness of m-Health apps among its users.

RESEARCH METHODOLOGY

Sample

The sampling size is 100 consisting of both male and female users of m-Health Apps residing at Chennai.

Method of Data Collection

The study used both primary and secondary data. Primary data was collected from the respondents using structured questionnaire. Purposive sampling was used to identify the target respondents. Snowball sampling technique was used to collect the responses from the users of m-Health Apps. Secondary data used in the study were obtained from research papers, books, newspaper articles, journals, websites of retailers and research reports.

Structure of the questionnaire

The structure of the questionnaire is presented on given table:

Table 1 Structure Of The Questionnaire	
Section A	Demographic details of respondents
Section B	Respondents view on M Health Apps
	Respondents Satisfaction check and preferential check

Period of study

The period of study ranges during December 2020 to March 2021.

Research Tools

The study has used Chi-square analysis to test the association between demographic variables and the level of awareness about m-Health apps. Also the association between age of the respondents and the ability of m-health apps in the self-management of health of respondents was analysed

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Demographic profile of the sample

A total of 100 respondents participated in the study. Demographic characteristics of the sample including, age, gender, education, occupation, monthly income and marital status are presented in Table 2.

Table 2 Demographic Profile		
Particulars	**No. of Respondents**	**Percentage**
AGE		
19-25	68	68
25-31	22	22
31-36	10	10
TOTAL	100	100
GENDER		
Male	36	36
Female	64	64
TOTAL	100	100
EDUCATION		
High School	3	3
Under Graduate	27	27
Post Graduate	28	28
Professional	12	12
TOTAL	100	100
OCCUPATION		
Student	62	62
Employee	36	36
Homemaker	2	2
TOTAL	100	100
MONTHLY INCOME		
Below 10,000	56	56
10,000-50,000	18	18
50,000- 1,00,000	13	13
1,00,000 and above	13	13
TOTAL	100	100
MARITAL STATUS		
Single	77	77
Married	23	23
TOTAL	100	100
Source: primary data		

RESULTS AND DISCUSSION

Table 3 shows the different m-Health apps used by the respondents. Healthify Me, My Calendar and Fit Bit are the M Health apps used by majority of the respondents.

Table 3 Usage of m-Health Apps			
PARTICULARS	**No.**	**PARTICULARS**	**No**
1 Mg	1	Mi Fitness App	5
Healthify Me	11	U Health	1
Flo	2	Medkit	1
Period Tracker	6	Absfit	1
Huwae Health	1	Nike Running	2
My Calendar	11	Garmin Connect	1
Fit Bit	10	Apple Health	5
Aerobics	1	Strava	1
Bettermen	1	M Health	1
Practo	5	Docs App	1
Clue	3	Activity Tracker	2
My Fitness Pal	4	Skin	1
Health Engine	1	Google Fit	1
Health App	5	Eatfit	1
Lybrate	1	Student Health App	1
Luna Cycle	1	Keep	1
Maya	1	Fastrack Reflex	1
Fooducate	1	Mednet M Health	1
Headspace	1	Samsung Health	2
Aaptiv	1	Carezone	1
Pocket Yoga	1	Sworkit	1
Cody Bush Fitness	1	Health Top	1
Source: Primary Data			

As in results, to prove the objectives and hypotheses, following Chi-square tests are discussed below.

H_{01}: There is no significant association between level of awareness of m-Health apps and income of respondents.

H_{11}: There is a significant association between level of awareness of m-Health apps and income of respondents.

From Table 4 it is observed that the calculated p- value is 0.35 (p<0.05). Hence, $H_{01}$is rejected. Thus, there is a significance association between income and level of awareness of m-Health among the respondents.

Table 4 Chi-Square Test for association between level of Awareness and Income			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	**13.556[a]**	**6**	**.035**
Likelihood Ratio	12.674	6	.049
Linear-by-Linear Association	1.627	1	.202
N of Valid Cases	100		
Note: Values computed using SPSS software. a. 6 cells (50.0%) have expected count less than 5. The minimum expected count is 1.04.			

H_{02}: There is no significant association between m-Health apps on self-management of health and age of respondents.

H_{12}: There is a significant association between m-Health apps on self-management of health and age of respondents.

In table 5, it is observed that the calculated p- value is 0.007 (p<0.05). Hence, $H_{02}$is rejected. Thus, there is a significance association between m-Health apps on self- management of health and age of respondents.

Table 5 Chi-Square Test for association between Self-managementof health and Age			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	**14.218[a]**	**4**	**.007**
Likelihood Ratio	15.934	4	.003
Linear-by-Linear Association	12.479	1	.000
N of Valid Cases	100		
Note: Values computed using SPSS software. a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is 60.			

Table 6 shows the data on perception for usefulness of m-health apps among its users. 12% of the respondents strongly agree that m-health apps are useful and 54% of them agree that it is useful. Only 2% of the respondents felt that it is not useful to them.

Table 6 - Usefulness Of M-Health Apps		
Particulars	**No of respondents**	**%**
Strongly Agree	12	12
Agree	54	54
Neutral	32	32
Strongly Disagree	2	2
Disagree	0	0
Total	100	100
Source: Primary Data		

SPECIFIC FINDINGS

- 78% of the respondents have heard about the term m-Health apps.
- 38% of the respondents have heard about m-Health from friends, 30% through social media, 18% through advertisements, 10% from family and 4% from doctors.
- Only 8% have high awareness, 61% have average awareness and 31% have low awareness about m-Health apps.
- 61% said health apps helps them to track their health, 35% said it motivates them, 46% said it provides useful reminders and 12% said it was fun using the health app.
- 59% are comfortable with sharing their personal contact details to m-health apps and 41% are not comfortable with it.
- 37% of the respondents feel m-Health apps are reliable.
- After using health apps 42% people changed their diet, 47% people started doing physical activity, 14% people did regular check-ups.
- 31% of the respondents daily spend time on m-health apps, 22% of the respondents spend weekly, 11% of the respondents spend monthly and 36% of the respondents spend time rarely on m-health apps.
- About 16% of the respondents rated very high, 37% rated high, 38% rated neutral , 7% rated low and only 2% rated very low about their m-Health apps.
- 85% of the respondents told they will suggest m-Health to others.

SUGGESTIONS

1. Mobile apps should take permission related to terms and conditions to stop abusive users, terminate access or accounts at sole discretion and enforce rules and guidelines.
2. To create awareness among people, the app providers should have tie ups with pharmaceuticals and doctors.
3. M-health apps should also have tie up with apps providing healthy foodsthat specializes in delivering customized salads/vegan based diet to health conscious customers as per their calorie requirements/health goals.

4. To encourage the frequent usage of the app, the app providers could encourage the users to collect maximum points on the achievement of a certain number of activities in a day.

CONCLUSION

Technology has led to the expansion of various amenities in the world. The m-Health apps gains importance because it makes healthcare practices accessible to the public through mobile communication technologies in a variety of ways like providing healthcare information, collecting health data, observing patients, etc. This study has found that m-health apps are highly convenient and preferred by the upcoming generation due to its potential to reduce overall costs, overall process time involved and to create a healthy lifestyle orientation in a world leaning towards various health ailments. Moreover, it provides flexibility to the individual to choose between self-management and consultative management of healthcare like never before.

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