

Utilization of mHealth Services in Dhamrai Upazila of Dhaka District, Bangladesh

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Abstract

Purpose: The adoption and use of mHealth is considered as an effective intervention to improve health sector performance in developing countries across the world. Yet mHealth is in the early stage of its implementation in many countries. This study aims to identify the patterns, extent, motivations, and problems of mHealth applications in Bangladesh.

Methods: The study was done in Dhamrai Upazila of Dhaka district where 250 mobile-phone users were interviewed to identify their extent and reasons of using mHealth services. Based on literature review and focus group discussion in the study area, the research confined five dimensions or reasons for using mHealth services, six issues for motivational and discouraging factors each. Both descriptive and inferential statistics were used to analyze data using statistical software STATA.

Findings: Calling doctor's private office is top ranked mHealth application. In this connection, 38 percent respondents used at least four types of mHealth applications among five dimensions and 30 percent respondents used all types of mHealth applications. On an average, respondents used near about four types of application where the mean application is 3.82 out of 5. Hypothesis testing result shows that male's mHealth application is higher than that of female. Again, average mHealth application of extended family is higher than that of nuclear family. Both findings are statistically significant at 1 percent level. Regarding the motivational factor of using mHealth application, employed group has ranked 'time saving' and unemployed group has ranked 'accessibility from remote area' as the most motivational factor. On the other hand, both groups have ranked 'not reaching focal person timely' as the most discouraging factor of adopting mHealth. Spearman's rank correlation coefficient reports that, between employed and unemployed group, there exist 77 percent resemblance in benefit rank and 94 percent resemblance in problem rank. Proper regulation is essential to have proper coordination among health service providers, seekers and telecommunication service providers.

Key words: mHealth, eHealth, mHealth Applications, Public Health, Motivational Factor.

Introduction

Health is one of the fundamental rights of human being and is an important indicator of development of a nation. Efficient health system has a positive and overriding impact on the economy as well. An efficient health system directly impacts on individual productivity and on aggregate economic development of citizens of a country (Bloom and Canning, 2008). Health care system covers both health-related issues and development issues as health care systems account for 9 percent of global production and a significant portion of global empowerment (Saka et al., 2012). World Health Organization (2001) found that increasing life expectancy at birth by 10 percent will increase the economic growth rate by 0.35 percent a year. Despite the important role played by health sector, serious problems continue to be experienced in developing countries. Developing countries like Bangladesh experience lack of qualified doctors due to brain drain (Adkoli, 2006) and shortage in medical training services, insufficient funds to equip health institutions with modern technologies, failure of health policies to address short and long term needs, low budgetary allocation to the health sector among others (Ahmed et al., 2013; Hoque et al., 2014). In general, majority of the citizens in developing countries, especially in rural areas suffer from poor accessibility to quality healthcare services due to scarcity of highly trained clinicians, weak health infrastructure and high cost of healthcare

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services (Albahrain et al., 2014). Recent literatures suggest mobile technologies have the potential to improve access to and use of health services, especially among disadvantaged people in developing countries (Hoque, 2016; Hoque et al., 2014; Chib et al., 2015).

Mobile phone penetration has shown a fast increase in developing countries over the past decade. The proliferation and adoption of mobile phone technologies within developing countries has created an opportunity to reach health care services to millions of people who would have been out of reach. Use of mobile or wireless technology, often called mHealth technology, is considered to be the fastest growing phenomena in healthcare with around eighty percent of rural areas in the developing world having access to the mobile networks (Albahrain et al., 2014). Of the 5.3 billion mobile phone subscriptions held worldwide, 3.8 billion of those, or 73 percent, represent individuals living in developing countries. Nearly 90 percent of the world is now covered by a wireless signal, ensuring that formerly isolated individuals, such as farmers in rural Bangladesh, have the potential to access these technologies and communicate globally (Lemaire, 2011).

So, there is a growing interest among researchers and policy makers about the adoption and use of mHealth as an effective intervention to improve health sector performance. The use of mobile and wireless technologies to support the achievement of health objectives has the potential to transform the face of health service delivery across the globe. A powerful combination of factors including advances in mobile technology and application, increasing opportunities for integrating mobile health into existing eHealth services and ever increasing coverage of mobile networks, is driving this change (World Health Organization 2011).

mHealth is still in its early stages of development and a number of projects had been initiated at different parts of the world including Bangladesh. The success of those projects has already started to transform healthcare delivery in the developing world. A number of researches have been done focusing on the process, type of applications, benefits and challenges of mHealth adoption at different parts of the world. There is still scope to conduct study on the motivation and pattern of use and possible areas of advancement of mHealth services in the context of Bangladesh since it is relatively a new concept of health care service and few numbers of researches are found in the context of Bangladesh. So, this research aims to find out pattern of use of mHealth and the reasons for using mHealth services, along with problems, by the citizens of Bangladesh.

Objectives of the Study

The objectives of the study were:

- i. To identify the pattern and extent of utilization of mHealth services
- ii. To observe whether extent of mHealth applications vary across gender (male vs. female) and across family type (nuclear vs. extended family)
- iii. To point out motivational factors and discouraging factors towards adopting mHealth services, for both employed and unemployed groups. The research also intended to compare similarity in identifying both motivational factors and discouraging factors of mHealth applications between groups.

Literature Review

Over the past decade, the rapid advancement in mobile and wireless technologies had changed the way of health service delivery across the world. The record level spread of mobile technologies and their innovative applications have shown strong potential for revolutionize healthcare, particularly in low-resource settings of low and middle income countries (Kahn et al., 2010). Health care using mobile phones are more commonly known as mHealth in literatures. Although the definitions vary in different literatures, the World Health Organization's Global Observatory for eHealth defined mHealth as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices" (World Health Organization, 2011). United Nations Foundation (2009) defined mHealth as the application of wireless technologies to transmit different data contents and services which are accessible by health workers through mobile devices such as mobile phones, PDAs, smart phones and Tablet PCs etc. Broadly, it can be defined as the use of portable devices with the capability to create, store, retrieve, and transmit data in real time between end users for

improving patient safety and quality of care (Vital Wave Consulting, 2009). Furthermore, Aker and Mbiti (2010) defined it as a personalized and interactive service whose main goal is to provide ubiquitous and universal access to medical advice and information to any users at any time over mobile platform. Mobile health incorporates a wide range of programs. A World Health Organization (WHO) survey of its 114 member states categorized mHealth programs into fourteen category of services namely: health call centers, emergency toll-free telephone services, emergencies and disasters management, mobile telemedicine, appointment reminders, community mobilization and health promotion, treatment compliance, mobile patient records, information access, patient monitoring, health surveys and data collection, surveillance, health awareness raising, and decision support systems. The survey also found that over 80 percent of these countries reported at least one mHealth initiative in their country, while some reported as many as six. The four most frequently reported mHealth initiatives were: health call centers (59 percent), emergency toll-free telephone services (55 percent), managing emergencies and disasters (54 percent), and mobile telemedicine (49 percent) while surveillance, raising public awareness, and decision support systems were the least frequently used mHealth service”(World Health Organization, 2011). Another study by the United Nations Foundation and Vodafone Foundation had listed 51 mHealth programs that were operating in 26 developing countries all over the world. These programs and projects focused on six main areas: treatment and support services, health education and awareness services, data collection and remote monitoring services, disease surveillance and drug adherence services, health information systems and point of care services, and emergency medical services (United Nations Foundation, 2009; Vital Wave Consulting, 2009). Mobile technologies may be used by patients, healthcare providers, the general population, or a combination of all involved parties. When used by the general population, services tend to be more simplistic in nature: awareness messages, treatment and/or appointment reminders, or help lines. Healthcare workers may use the technologies for more advanced purposes, such as patient surveys, population surveys (e.g. vaccination rates), diagnosis algorithms, and mobile telemedicine (World Health Organization, 2011).

The general benefits of exploiting mobile technologies in health care systems includes assurance of quick health care data collection and processing without complicated IT infrastructure which improves health systems’ accuracy and efficiency (Hameed, 2003). Health promotion campaigns using mHealth technologies most frequently make use of text messaging technology to send information on pertinent health issues to target populations (Cole-Lewis and Kershaw, 2010). Although one-way communication campaigns are common, some projects, such as Uganda’s ‘Text to Change’, make use of two-way communication technologies by creating text message quizzes for users (Jamison et al., 2013). With remote data collection, information can be entered and uploaded in real time, with timely analysis providing policymakers accurate, reliable data for reporting and planning (World Health Organization, 2011). Remote monitoring of patients is possible by using mobile phones where patients (often in rural areas) are sent information on their health condition, appointment reminders, and treatment reminders (Chen et al., 2008; Sidney et al., 2011). In some applications, patients also text back information on their adherence, state of health, or questions on health concerns (Singh et al., 2012). One example of a remote monitoring application is South Africa’s Cell-Life: Aftercare. Using mobile technologies, healthcare workers can now receive real-time information and diagnosis support, enabling them to provide better care to patients while simultaneously increasing their knowledge base (Littman-Quinn et al., 2011; Chang et al., 2012). Mobile phone technologies can also be used to track disease incidence and alert officials if case numbers indicating a need for action are reached (Aanensen et al., 2009). When combined with Global Positioning System (GPS) capabilities, mobile phone technologies can also be used to create maps of ‘disease hot-spots’, identifying areas requiring additional surveillance and/or increased resource distribution (Curioso et al., 2005; Johnson and Blazes, 2007). Diagnostic and treatment support programs use mobile phone technologies to guide healthcare workers through the diagnostic process (Vital Wave Consulting, 2009). Previously installed software prompts the healthcare worker to enter symptoms, signs, and various measurements, and uses this information to offer diagnostic and treatment suggestions based on stored medical information (Chib, 2010). With mobile assistance, healthcare workers are now taken through the process step by step, improving diagnosis and management of childhood illnesses (DeRenzi et al., 2008). Although levels of adoption vary among countries, the application of mHealth technologies has high appeal at a global level. High income countries were found to adopt more of such technologies than the low income countries.

The lowest rate of mHealth adoption was observed in Africa while the highest rate adoption was found in North America, South America, and Southeast Asia (Hoque et al., 2015; WHO, 2011). Developing nations could be more benefited from the use of mHealth since mobile technologies have the potential to bridge systemic gaps needed to improve access to and use of health services, particularly among underserved populations of such countries (Hoque, 2016). Albatatin et al. (2014) noted that in the developing world, the main factors that are conducive to the implementation and use for mHealth tools are poor access to healthcare, higher health care costs, emerging diseases, and sub-standard healthcare quality. According to Jeannine (2011), the factors that have led to the current rapid development of mHealth in the developing world are the growing number of mobile phone users, the need for treating large rural population, the lack of timely disease control, low cost of mobile phones, the cultural factors, the shortage of health care workers, and the inadequacy of resources and infrastructure. Adoption of mHealth was also found to vary across genders. Hoque (2016) described from (GSMA, 2010) that female is less interested than male to use new technology, a 'gender gap' almost twice that for all low and middle-income countries in South East Asia. Thus it is important to consider gender issues in adoption mHealth services.

E-health and m-health initiatives in Bangladesh at both Government and private sector are observed. In 2009, Ministry of Health established mHealth (health service through mobile phone) service in each of all upazila and district hospitals. These hospitals are supplied with a mobile phone to act as 24/7 health call centers for the citizens. This initiative has made health services accessible to poor people from long distance and even at late night, free of cost (Hoque, 2014). Plans are in place to expand telemedicine in hospitals and to provide oversight of quality, regulation, disease surveillance and so forth. Finally, a Short Message Service (SMS)-based pregnancy advice service, initiated in March 2010, offered guidance on safe pregnancy. Pregnant mothers have to register in order to receive antenatal, delivery and postnatal advice. There is limited data as to the utilization or impact of the scheme thus far, though one small-scale assessment was generally favorable (Afroz, 2012). In addition to government initiatives, NGOs mobile telephone operators, and universities are also playing vital role in implementation of mHealth services to cover the huge population of the country. A large number of mHealth projects are run on non-government initiatives of which MAMA Bangladesh, Aponjon, Manosh innovation are few to name (Hoque, 2015). Although a number of projects have been initiated both at government and private initiatives, they are still in the early stage of implementation and the evaluation of the outcomes of such projects at macro level are yet to be known. So, further research needs to be done to identify reasons, pattern and outcome of using mHealth services in the context of Bangladesh.

Materials and Methods

The study was confined to Dhamrai upazila of Dhaka district of Bangladesh. The upazila is located about 40 km from the main city. Dhaka city and urban center of Dhamrai upazila has numerous number of health care service providers. Households' mobile possession is commonly observed. There are 94,038 households in the Dhamrai upazila (BBS, 2015). The households are diverse in income, employment, family size, family type, age, education and gender of household head, etc. Literatures suggest that all these variables exert influence on household decision making. Accordingly, these factors influence on health care issue which is one of the vital component in household decision making. To capture the influence of these diverse factors at a particular time on households' perception and adoption of mHealth application, the researched pursued cross-sectional study. Data was collected during January-February 2016. To get comprehensive idea of the mHealth issue, the researchers emphasized on diversity, on possible extent. Household was chosen as unit of analysis. A number of 250 samples were selected randomly. Only one sample was taken from a household. Possessing mobile phone and active use of same in last three consecutive months were sample inclusion criteria. Households lacked mentioned criteria were replaced for sample. Concerned household head was interviewed with structured questionnaire. The questionnaire covered demographic features of household head, socio-economic characteristics of the household, extent of using mHealth, motivating and discouraging factors of mobile healthcare uses mainly. Descriptive statistics was used to present background information of the respondents and households. To check if mHealth applications vary across different group, some hypotheses were tested.

Dimensions of mHealth Application: The use variety of mHealth depend on the need of household and also on offered services by health care service providers. GSMA (2010) found that population aging getting severe in

Europe. It is observed in many other countries like Japan. Old people might have less mobility and depend on mHealth applications. It is more applicable for guiding chronic patients. Many people inquire about some basic information regarding cost, time, appoint procedure etc. over phone. Other health promotion hotlines accept questions from users and respond with health advices (Vital Wave Consulting, 2009). World Bank (2011) reported that in health commodities, there creates 5 billion points of contract between consumer, health service providers, and firms with a view to increase quality and access to health care. Ministry of Health and Family Welfare of Bangladesh has also initiated to extend health services through mobile phone. Rural people can contact to upazila health complex for details about ambulance, doctors' visiting hours, working day, services available, emergency service etc. (Ministry of Health and Family Welfare, 2008). Developed countries use different health care apps through smartphone which is not well practiced in Bangladesh. Based on literature and a focused group discussion conducted in the study area, the research confined five major dimensions of mHealth application. These were calling to doctor directly, calling to hospital for facilities, calling to doctors' private office, calling for ambulance and calling to get information about health advice.

Hypothesis Testing

Hypothesis Testing I: Resilient and Responsive Health Systems (2015) reported that in many societies women has less literacy and access with regard to mHealth. Male dominant family culture exists in Bangladesh but women are getting empowered through participation in education, employment and other economic activities. Thus, the research intended to observe how mHealth applications varied across gender.

H₀: There is no mean difference in application of mHealth services between male and female.

H₁: Mean application of mHealth services is higher in case of male than female.

Hypothesis Testing II: Various researches find correlation between family health status and family type. In this regard, Centers for Disease Control and Prevention (2010) found that households with two parents and children are healthier than other category. Since both types of families are very common in Bangladesh, the research intended to find if there existed mean difference in number of mHealth applications across family type.

H₀: There is no mean difference in application of mHealth services between nuclear family and extended family.

H₁: There is mean difference in application of mHealth services between nuclear family and extended family.

Identification of Motivational Factors and Discouraging Factors: Individuals have different reasons for adopting mHealth services. They face/perceive different problems as well. Elsevier Clinical Solutions (2015) found that for variety of social, professional and technical reasons mHealth application varies where employment type and status can also be a determinant. Based on literature and focused group discussion, the research confined response in six specified issues, in case of both motivational and discouraging factors of mHealth. Based on response rate, both issues were ranked.

Spearman's Correlation Coefficient: Employment is related to time constraint, which is also related to income and perception. Thus, the research attempted to compare the resemblance of perception of employed and unemployed group with regard to ranking both benefits and problems of using mHealth. Spearman's correlation coefficient was used to identify symmetry level in perception between groups. Here, R= Rank correlation coefficient; D = Difference of rank between paired item in two series, and N= total number of pairs.

Results and Discussion

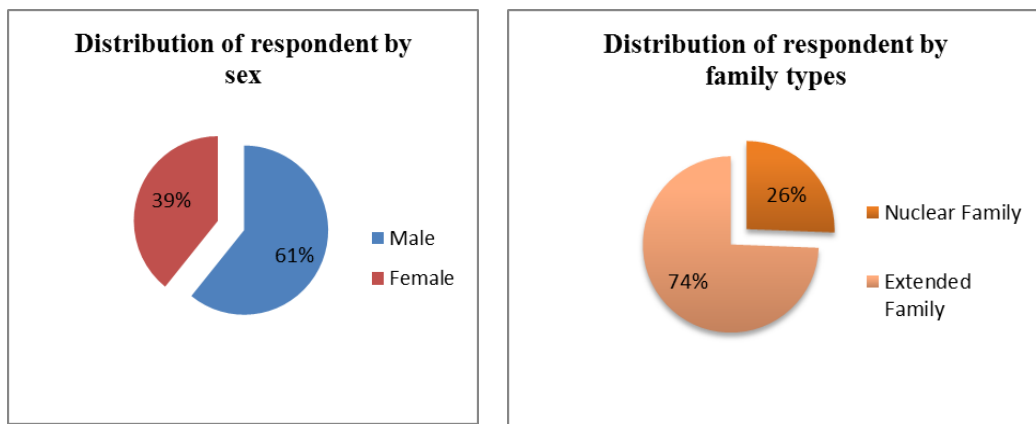
Demographic Characteristics of the Respondents: The respondents are diverse in socioeconomic and demographic characteristics like age, sex, marital status, family type etc. The average age of the respondents about 37 years where age of most of the respondents below 36 years.

Table no. 1: Distribution of Respondent by Age

Age	Frequency	Percentage	Statistics
20-35	142	56.8	Mean=37.04, Median=35.00, Std. Deviation=12.10, Minimum=20, Maximum=65
36-50	71	28.4	
51-65	37	14.8	
Total	250	100.0	

Source: Authors' Compilation based on Field Survey, 2016

Result in Figure no. 1 shows that the ratio of male and female respondents is 61 percent and 39 percent respectively among 250 respondents in the study area. While observing family type, it is seen that 26 percent respondents belong in nuclear family where the rest 74 percent belong in extended family.



Source: Authors' Compilation based on Field Survey, 2016

Figure1: Distribution of Respondent by Sex and Family Type

From view point of marital status, it is seen that 85.2 percent respondents are married and the rest them are either single or widowed. Among respondents, 58.4 percent respondents are Muslims and the rest of the respondents are Hindu. The highest numbers of respondents are illiterate (30.8 percent) where mean year of schooling is only 2.6 years. Survey result finds that the percentage of respondents passing primary, secondary and higher secondary education are 17.6 percent, 22.8 percent and 19.2 percent respectively where 9.6 percent respondents have passed at least graduation.

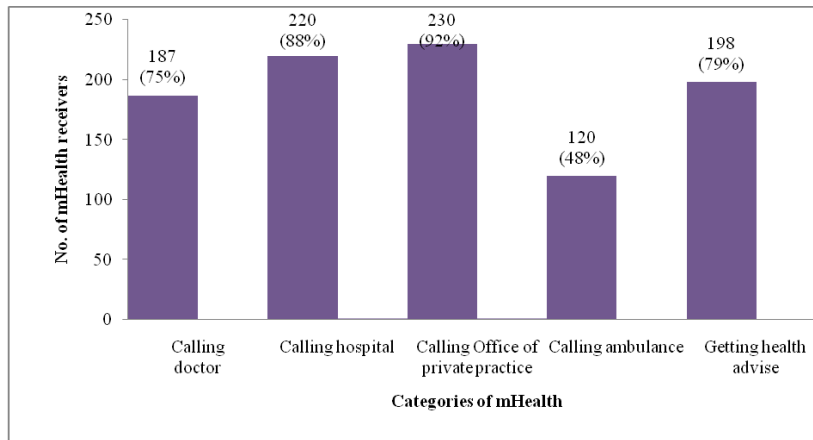
Employment Source and Income: Varied professional attachment is observed among respondents. Among all 26 percent respondent is housewife, 16 percent is student and 6 percent is unemployed. Regarding working class, the category of farmer, day laborer and businessman are 15, 14, and 13 percent respectively. Monthly income data states that most respondents are from low income group. Table no. 2 shows that, only 29.6 percent respondents' monthly income exceeds BDT 11,000 where average monthly income of the 250 respondents is only BDT 9,532.

Table 2: Income Distribution of the Respondents

Income (BDT/Month)	Frequency	Percentage	Statistics
1,000-5,000	32	12.8	Mean=BDT 9,532; Median=BDT 10,000; Std. Deviation=3,497
6,000-10,000	144	57.6	
11,000-15,000	69	27.6	
16,000-20,000	05	2.0	
Total	250	100.0	

Source: Authors' Compilation based on Field Survey, 2016

Pattern of Application of mHealth Services: Cell phones are used for the valid health related attributes like to contact with the doctor, hospital, visit, ambulance and to get health advice. Result shows that respondents are frequent user of mHealth and the dimensions of use also cover diverse area. Highest number of user worth 92 percent respondents, called to the office of private practice for knowing visiting hour, place, fees and other particulars of the doctor. Here 88 percent respondents called to hospital and private clinic for various purposes. Apart from calling ambulance, at least 75 percent respondents adopted other types of mHealth services. In this way, pain of getting health services has been reduced for getting different healthcare services through mobile phone.



Source: Authors' Compilation based on Field Survey, 2016

Figure 2: Purpose of Using Mobile Health Care (Multiple Answers Applicable, n=250)

According to the International Telecommunication Union (ITU), there are over 5 billion wireless subscribers at present; over 70 percent of them reside in low and middle- income countries (Statistica, 2016). The GSM Association reports commercial wireless signals cover over 85 percent of the world's population, which is even higher than the reach of the electrical grid. In Bangladesh, the number of mobile users is getting high in recent days. The peri-urban area is also progressing according to the national growth. The people are also getting aware regarding every service given by the telecommunication companies. Among all services, mHealth services are the most emerging one.

Extent of Application of mHealth Services: The research calculated binary response of regarding application of mHealth services in five predetermined purposes mentioned in figure no. 2. In that sense, maximum application score can be 5 (five) and minimum application can be 0 (zero). Result shows that 30 percent respondents used all five dimensions of mHealth in last three months, where 38 percent respondents received services at least four dimensions of mHealth. Here, Only 3.60 percent received only one category of mHealth services (see Table no.3).

Table 3: Distribution of Respondents According to Number of Applications of mHealth

No. of mHealth Application	Frequency	Percentage	Cumulative Percentage
1	9	3.60	3.60
2	22	8.80	12.40
3	49	19.60	32.00
4	95	38.00	70.00
5	75	30.00	100.00
Total	250	100.0	-

Source: Authors' Compilation based on Field Survey, 2016

The result in Table no 4, shows that the average application of mHealth score is 3.82, for male it is 3.96 and for female it is 3.60. Some respondents reported that in some categories, they received mHealth services, more than once but the research didn't consider that in calculating extent of mHealth application. Thus actual extent of application is higher than reported extent of application.

Results of Hypothesis Testing: The research observes variation of mHealth application across gender and across family type through hypothesis testing.

Table 4: Result of Hypothesis Testing I (Effect of Gender on mHealth Application)

Group	Observation	Mean	Std. Err.	Std. Dev.	t-ratio
Male	152	3.960526	0.090928	1.121031	2.62
Female	98	3.602041	0.09593	0.949659	
Combined	250	3.82	0.067651	1.069662	
Diff	0.358486	0.136974	0.088704	0.628267	
Mean(diff) = Mean (mHealth Male — mHealth Female)					
Ha: Mean(diff) < 0		Ha: Mean(diff) != 0		Ha: Mean(diff) > 0	
Pr(T < t) = 0.9953		Pr(T > t) = 0.0094		Pr(T > t) = 0.0047	

Source: Authors' Compilation based on Field Survey, 2016

Result in above table shows that we can't accept the null hypothesis because male has higher tendency of using mHealth services than the female respondents. On an average male's mHealth application is 0.14 times higher (out of 5 applications) than that of female which is statistically significant at 1 percent level. One reason could be employment status of the male. In the traditional family male are mainly bread earners. For the sake of job, they collect information via mobile phone that saves time. They have more affiliation and access to information for getting mHealth care services also. Number of mHealth applications varies across family type also.

Table 5: Result of Hypothesis Testing II (Effect of Family Type on mHealth Application)

Group	Observation	Mean	Std. Err.	Std. Dev.	t-ratio
Nuclear family	64	3.484375	0.160592	1.284736	- 2.96
Extended family	186	3.935484	0.070541	0.962052	
Combined	250	3.82	0.067651	1.069662	
Diff	-0.45111	0.152662	-0.75179	-0.15043	
mean(diff) = mean (mHealth nuclear family — mHealth extended family)					
Ha: mean(diff) < 0		Ha: mean(diff) != 0		Ha: mean(diff) > 0	
Pr(T < t) = 0.0017		Pr(T > t) = 0.0034		Pr(T > t) = 0.9983	

Source: Authors' Compilation based on Field Survey, 2016

Above table shows that the mean application of mHealth services of respondents from nuclear family is 3.48, where the value is 3.94 for extended family. We reject the null hypothesis of equality of mHealth applications between nuclear family and extended family because average use of mobile phone for health services of respondents of extended family is 0.15 uni higher than that of nuclear family which is statistically significant at 1 percent level. One of the reasons for the stated result could be higher family member of the extended family. When number of family member increases, members need to make more contacts with health services providers in various purposes.

Behavioral Motivation and Causative Ground of mhealth: People want to lead a healthy life by getting healthcare support from any instance. Some factors have facilitated to adopt mHealth services. Result shows that 98 percent of employed person pursue mHealth for saving time and thus rank '1' in the benefit rank among six identified issues. For employed group, other motivating factors of mHealth as per rank are accessibility of the service from remote area, option of getting some tips at home, advice from certified doctor, saving transport cost and less expensive

option of getting treatment respectively. In case of unemployed group, perception differs, where accessibility from remote area the most beneficial issue and ranked '1' among considered six beneficial issues. Unemployed (including housewife), has less mobility and less access to information. Employed person move out for job and also they have more access to the information regarding health care services. Employment status influences to consider time value, mobility and also access to information differently for which there is difference between groups. The Spearman's rank correlation coefficient is 0.77 which indicates that on an average there exists 77 percent similarity of the opinion between employed and unemployed group. The rest 23 percent deviation can be explained by variation of employment status.

Table 6: Motivation towards mhealth Care Services (Multiple Answers Table, N=250)

Benefits of using mobile healthcare	Response Rate		Benefit Rank		Correlation Coefficient
	Employed [n=132]	Unemployed [n=118]	Employed [n=132]	Unemployed [n=118]	
Less expensive	71%	84%	6	4	0.77143
Time saving	98%	92%	1	2	
Saving transportation cost	77%	61%	5	6	
Treatment at home	93%	88%	3	3	
Advice from certified doctor	86%	80%	4	5	
Access from remote area	97%	95%	2	1	

Source: Authors' Compilation based on Field Survey, 2016

Daunting Factors of mHealth Care Services: Total number of mobile phone users in Bangladesh is huge covering both rural and urban areas. But a minor portion of them receive mHealth services. Again, many health care providers don't provide such facilities. Even someone claim that, the scope and extent of mHealth is not wide enough. Various reasons are liable for it. Respondents report that 'Not reaching focal person timely' is the most problem of mHealth. Doctors, diagnostics, physicians remain busy to serve on-spot patients. Many service holders serve in a multiple places. So, they stay for certain duration in a in a particular clinic. So, even after repeated call, attendant cannot connect to the right people. This is the top ranked problem reported by both employed and unemployed group. The severity of the problem is also noticed by 94 percent and 98 percent response in favor of the problem respectively (see Table no.7).

Table7: Problems of Receiving mhealth Care Services (Multiple Answers Table, N=250)

Problems of using mobile healthcare	Response Rate		Problem Rank		Correlation Coefficient
	Employed [n=132]	Unemployed [n=118]	Employed [n=132]	Unemployed [n=118]	
Treatment without diagnosis	77%	75%	3	4	0.94286
Non-response in the destination	83%	79%	2	2	
Not reaching focal person timely	94%	98%	1	1	
Unable to describe in details	67%	78%	4	3	
Not getting specialized doctor	61%	64%	5	5	
Not getting service for all diseases	48%	43%	6	6	

Source: Authors' Compilation based on Field Survey, 2016

It is observed that the Spearman's rank correlation coefficient in benefit rank is approximately 0.77 where as the value for problem rank is 0.94. It indicates that incase of benefit rank resemblance of perception between employed and unemployed group is about 77 percent where the resemblance is by far higher in case of problem rank which is about 94 percent. The reason behind higher difference in benefit rank is that considered factors are attached to the

individual characters is of the respondents like engagement in job. On the other hand, issues considered in problem rank are more relevant to the mHealth service providers like performance of clinic and hospital. Thus, problem rank is not influenced by individual factors where both group face the same problems. Thus resemblance between employed and unemployed group is very high in case of problem rank.

Conclusion

A very large proportion of the rural population has little or no access to modern health care facilities and relies on informal village doctors. Though mHealth services are not applicable to all types of diseases and requirement, still it is beneficial in many respects. Despite high mobile penetration in Bangladesh, mHealth application is not widely spread in Bangladesh. Health care services provider are not well arranged and equipped with mHealth culture. Since a large rural and remote people lack health access instantly and conveniently, spread of mHealth culture can minimize pains in accessing health services. It is very tempting to assume that m-health interventions can bring quality health services to rural areas without the enormous resource costs that would be required to train, equip and incentivize qualified providers to work in these areas. Neither mobile network operators nor health service providers are well equipped and interlinked to offer and manage mHealth applications. Authority need to take administrative step for better management of mHealth by developing infrastructures accordingly.

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