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Research Article

M-TECHNOLOGY FOR HEALTH CARE: AN ACCOMPLISHMENT OR A DISAPPOINTMENT: CASE STUDIES FROM NADIA AND BIRBHUM DISTRICT

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A R T I C L E I N F O

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A B S T R A C T

Over decades, m-technology studies have assumed global attention especially among the developing nations like India. In rural India, the usage of m-technology is a question mark for many. Digital divide within the rural community has intensified because of high literacy rate and scare and fear to use m-technology. Scholars understanding technologies for people and health care opined that studies on health care and m-technology mostly focus on primary and secondary healthcare facilities in the village at various levels. Telemedicine is being used as shortcut to bring rural and remote areas in the mainstream of healthcare delivery (Sharma, 2004). They are also of an opinion that a lot of software's are designed keeping in view the Indian condition. This paper attempts to elaborate on the usage of m-m-technology as a medium of a health care in the rural areas of Nadia and Birbhum district, West Bengal and whether the young population has a reach to mhealth and other technological endeavours in the rural set up.

INTRODUCTION

The world has undergone a rapid m-technology transition during the past decade. There is a diffusion of m-technology which affect health and healthcare this is also due to dimensions of political participation and economic activity of the youth.(Haenssgen & Ariana 2017) The use of digital technologies has grown rapidly around the world, including among indigenous young people who face social disadvantage. The potential to use m-technology for communication, providing information and creating and responding to social change is the basic medium of interaction in the present day scenario. Strong cultural identity and community and family connections, which can be enhanced throughm-technology, are linked to improved educational and health outcomes. (Rice, Haynes, Royce and Thompson, 2016) This paper attempts to intricate on the usage of m-technology as a medium of a health care in the rural areas of Nadia and Birbhum district West Bengal and whether the young population has a reach to mhealth and other technological endeavours in the rural set up.

Objectives

To study whether m-technology is able to influence healthcare facilities and whether the necessity of the usage is communicated to the youth.

To examine m-technology for health care is accomplishment in the districts of Nadia and Birbhum

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To elucidate whether m-technology for health care is a disappointment in the districts of Nadia and Birbhum

To investigate the knowledge and awareness pattern of the youth in usage of m-technology endeavours and health as a medium of health care in the two districts.

LITERATURE REVIEW

Healthcare is an information-based field with increasing use of information and communication technologies (ICTs). Current ICT tools are in development, but with brighter future to support healthcare. The present literature focuses on five areas of ICT in healthcare: electronic health record (EHR), health information exchange (HIE), telemedicine, mHealth, and social media. In each of these areas, scholars have examined the current applications and have discussed the main challenges to reach a wider adoption. Steps to better EHRs include: review the current EHR systems, try to emulate benchmark practices, involve and train the users of the system, evaluate the benefits, and update the system when needed. HIE requires the simplification and harmonization of existing standards, more precise legal rules, subsidies to sustainability. Telemedicine needs legal definition for providing and consuming services, subsidies to sustainability, and adapting to different situations. (Bukachi & Pakenham-Walsh 2007)

Electronic health (ehealth) is defined as a convergence of wide reaching technologies like the Internet/compute / telephony interactive voice message, wireless communication and the direct access to healthcare provider,care management education and wellness. Mobile health mhealth is defined as a subset of ehealth that uses mobile devices to provide health

services.Mhealth typically refers to use of portable devices with the capability to create, store and retrieve transmitdata in real time between end users for the purpose of improving patient safety and quality of car. On important advantage of mhealth technologies is the ability to interact directly with the patients and to encourage peer to peer sharing as well as coaching on the part of health care providers through online communities of patients and providers.(Oerther, Manjrekar & Oerther 2014)

Data from India's 2011 Census shows 59% of the country's households have a mobile phone. Recognizing the opportunities available through mHealth, the Government of India (GoI) has recently launched the "E-Mamta: Online Mother and Child Tracking System" to reduce the current maternal and infant mortality rates. The pilot program uses an online tracking system to monitor the health of pregnant females and infants with instantaneous capabilities to document adverse health events. It is envisioned that future implementations of the program will enable health authorities to initiate preventive action rapidly and avoid unnecessary maternal and infant mortality.(Oerthera, Manjrekarb&Oertherc 2014)

The most common theories and models used to explain m-technology acceptance are Theory of Reasoned Action, Theory of Planned Behaviour, M-technology Acceptance Model and Diffusion of Innovations Theory. The basic suggestion of Theory of Reasoned Action is that the attitude and subjective norms are the deterministic factors of the behaviour. While attitudes are comprised of behaviour oriented beliefs and expectations towards the results of the behaviour, the subjective norms are comprised of beliefs about the evaluation of other people who are important for the individual (Fishbein and Ajzen, 1975).In addition to the theory suggested by Fishbein and Azjen, the Planned Behaviour Theory includes perceived control variable (Ajzen, 1991). The perceived control is the beliefs about overcoming difficulties acting on behaviour (Ajzen, 1991). Another model that originates from the Theory of Reasoned Action, the M-technology Acceptance Model of Davis (1989), explains decision processes about m-technology. According to this model there are two variables affecting the m-technology usage of individual, which are perceived usefulness and perceived ease-of-use. These two factors constitute people's attitudes toward using m-technology and affect m-technology behaviour (Davis, 1989). The Diffusion of Innovations Theory states that some features of innovations, such as relative advantage, complexity, compatibility, trial ability and observability, determine its acceptance (Rogers, 2003).(Gücina&Berka 2015)

Kane (2014) states that the mobile technologies assure many benefits for the patients such as accessibility for healthcare, getting treatment, being under observation, self-assessment and checking up on the disease status. Moreover, the m-technology usage in healthcare provides financial savings for patient, doctor and government (Fontenot, 2014)

With the growing rate of usage of m-technology the use of mediums of m-technology support inhealthcare in the Indian context is inevitable. It is however necessary to assess end-user perceptions regarding mobile health interventions especially in the rural Indian context prior to its use in healthcare. This would contextualize the use of mobile phone communication for health to 70% of the country's population that resides in rural India. In a study conducted in South India the primary use of mobile phones was to make or receive phone calls (100%). Text messaging (SMS) was used by only 70 (14%) of the respondents. Studies point out that most of the respondents, (99%), were willing to receive health-related information on their mobile phones and did not consider receiving such information, an intrusion into their personal life. While receiving reminders for drug adherence was acceptable to most (98%) of our respondents, (89%) preferred voice calls alone to other forms of communication. Nearly all were willing to use their mobile phones to communicate with health personnel in emergencies and (75%) were willing to consult a doctor via the phone in an acute illness. Factors such as sex, English literacy, employment status, and presence of chronic disease affected preferences regarding mode and content of communication. The mobile phone, as a tool for receiving health information and supporting healthcare through mHealth interventions was acceptable in the rural Indian context.

Research studies have explored the acceptability of mHealth interventions for supporting adherence to antiretroviral therapy in South India and for healthcare consultation in rural North India The potential of mHealth is being harnessed by the Indian government in the 'Mother and Child Tracking System' (MCTS) within the 'National Rural Health Mission' (NRHM). The MCTS gathers health information from antenatal and postnatal women in an attempt to ensure healthcare delivery to these women and to under-five children. Text messaging or Short Message Service (SMS) m-technology is also used to communicate with 3.2 million Indian central government employees under the Central Government Health Scheme (CGHS). Plans for its use in adolescent health, reproductive health and family planning, substance abuse and non-communicable disease prevention and treatment, are underway. Given that the use of mobile phones, as a mode of communication in healthcare is inevitable, it is necessary to assess rural end-user perceptions and experiences with the m-technology . This would help contextualize healthcare delivery via mobile phones to 70% of the country's population residing in rural India. Rapid advances in mHealth call for the development of end-user friendly mobile phone applications that may be used for healthcare delivery. These applications should be simple, minimally intrusive and ensure confidentiality of personal information. It is equally important to contextualize every planned intervention to the population for which it is intended. With the Indian government's new impetus to use mobile phone m-technology in healthcare, mHealth services are expected to have a vast rural outreach. Given the immense potential for mHealth in India, we chose to explore experiences and perceptions of rural Indian mobile phone users towards using mobile phone m-technology in healthcare. (DeSouza, Rashmi, Vasanthi, Maria Joseph & Rodrigues 2014)

METHODOLOGY & LOCATION OF THE STUDY

The field of the study is Villages BalindiBaishpukur and Muraghacha in Nadia district and, Surul and Balabpur in Birbhum district in West Bengal, India.

These villages were selected since they were in and around two Universities of West Bengal were most of the youth were educated. These Universities are Visva Bharati Santiniketan, Birbhum and Bidhan Chandra Agricultural University, Nadia. These Universities had conducted many extensions

programmes with the youth. The villages selected were exposed to all the schemes which the University percolated down to the rural folk over years. The researcher selected youth clubs from each village as a convenient sampling method.

Villages	Surul, Birbhum district	Balabpur, Birbhum district	BalindiBaishpukur, Nadia district	Muraghacha, Nadia district
Youth Club members	265	200	255	150

Total members Birbhum district: 265+200=465
Total members Nadia district: 255+150=405

As a methodology, the researcher interacted with the respondents time and again to get an overview of the life cycle of the club members. The researcher attended the meeting with the held by the youth association members. During the primary stage a preliminary survey was done about their family members, income and livelihood procedures. Later case studies were taken by one to one interaction.

The study adopted a descriptive study design; this design was crucial in capturing the socio-economic characteristic of the study groups such as demographics data, economic status, social benefits. The study uses both primary data and secondary data. The information about the number of youth clubs in the village in respective development blocks was provided by the Block office.

FINDING AND DISCUSSION

The investigation was carried out in two districts to compare and contrast theusage of m-technology as a medium of a health care in the rural areas of Nadia and Birbhum district West Bengal. For understanding the usage of the m-technology various factors were explored to understand whether m-technology is able to influence healthcare facilities and whether the necessity of the usage is communicated to the youth. Factors such as reduce costs by usage of mhealth, engagement with patients and offer them more convenience and appeal through mhealth new service were positive factors considered by the rural youth. This was also supported by the study done by Oerthera, Manjrekarb & Oertherc 2014 while studying utilizing mobile health m-technology at the bottom of the pyramid. The other factors which influenced health care facilities through technologies and necessity of usage waspersonal privacy on behalf of patientsmaintained by the mhealth services and the distance to nearest healthcare provider and type of ICT assets owned by the household.

Items	Youth of Nadia		Youth of Birbhum	
	405		465	
Reduce cost by usage of mhealth	355	87%	400	86.02%
Engage with patients and offer them more convenience	258	63%	267	57.41%
personal privacy on behalf of patients	100	24.6%	70	15.05%
distance to nearest healthcare provider	200	49.3%	150	32.25%
type of ICT assets owned by the household	250	61.7	275	59.13%

It is found that youth in Birbhum were more influenced to use mhealth due to the reduce cost of usage but in case of Nadia district engagement with the patient and offering them convenience through mhealth was much more significant. Gücina & Berk (2015) studying technological acceptance of health care had an idea that ensuring personal privacy on behalf of patients is a major disadvantage might be a big problem in case exposure of important information may be stolen or they lose the mobile phones This was also found in case of both in Nadia and Birbhum district where youth did not believe that mhealth can provide personal privacy to the patient. The youth are of the opinion that they primarily search information as well as this facility provides opportunity of e-appointments. This was also advocated by Gücina Berk (2015) the usage of mhealth was also determined by the distance to nearest health care providers. Generally it was preferred to take and e appointment from the doctor and visit the doctor in person than to talk over the phone or using SMS. It was found that ICT assets were found in most of the households and family members are comfortable to use the assets. This was also pointed out by a study on Social Implications of M-technology Diffusion: Uncovering he Unintended Consequences of People's Health-Related Mobile Phone Use in Rural India and China Haenssgena & Arianaa (2017). The interesting point to note in the present study was the youth used the mobile applications keep themselves healthy. Although, it was found that many youth did not possess an expensive mobile but also they borrowed and shared the mobiles to be updated.

The present study also experimented the Unified Theory of Acceptance and Use of M-technology of Venkatesh, Morris, Davis and Davis (2003) this theory had proposed a model suggesting four basic factors affecting the individual's acceptance and usage of the newly encountered m-technology . The factors are performance expectancy, effort expectancy, social influence and facilitating conditions. The performance expectancy is the expected increase of performance. While discussing with the youth in both the districts it was found that by usage of m-technology for health care has increased performance of both the stakeholders ie the doctors and the patients to update the information of the wellbeing to each other. In case of effort expectancy also which is the ease of use related with the accepted m-technology. The youth venture of new applications in their mobile then and there to promote mhealth education to the rural folk. It has also been found that the youth volunteer to accompany the family members who are not aware for the latest m-technology or due to suspicious beliefs of confidentiality and privacy do not wish to use the same. Social influence was another factor for usage of the m-technology for health care. It is the perception of self-reflected by people who are important for the individual. In the rural set up of India till date even the youth are influenced by their surrounding and opt methods of livelihood as per the perceptions of the individuals surrounding. Youth club member who were proactive in various club activities were more inclined to use applications of mobile , SMS or computers to resort to health care providers while youth who visit the club occasionally volunteer for a conventional mode. The youth of both Birbhum and Nadia district were positive about personal and institutional support encouraging m-technology acceptance or in other words facilitating conditions that create beliefs about the existence of personal or institutional support encouraging m-technology acceptance. Although, all conditions available were not conducive to all the youth population but also the youth were ready to volunteer to increase suitability of the rural folk.

Items	Youth of Nadia 405	Youth of Birbhum 465
Knowledge about public health	255 (mhealth) 63% 150 (only Conventional health) 37%	352 (mhealth) 76% 113 (only Conventional health) 24.3%
Cultural compatibility of multimedia	325 80%	375 81%
Community and family connections	300 74%	325 69%
Use of social media for social marketing and health promotion programs	295 73%	365 78.4%
Barriers to social media use	250 61%	265 56.9

Most of the rural youth are aware about the mhealth facilities available. There are demonstrations and awareness arranged by the departments by VisvaBharatiSantiniketan and Bidhan Chandra Agricultural University. The percentages of youth who are not aware about mhealth believe in conventional medication since they are suspicious about using of smart phone. This was also pointed out by Ramdasa & Balasubramanianb in the study on health awareness and youth. Examining cultural compatibility of multimedia it is found that in both the districts youth are very much linked up with the multimedia. The culture of village is although conservative, but the idea of growing and connecting with the global world is an interesting observation. The youth integrate their community and family connections and also inculcate the behaviour of usage of multimedia, technological applications and m- methods to make their living comfortable. The youth also using the assistance of the Universities and the associations to promote the usage of health promotion programmes through facebook or WhatsApp. In case of Barriers to social media usage the youth are victims of the barriers in Birbhum as compared to Nadia district. Although in percentage the margin is very less. These barriers are due of suspicious ideas about electronic usage; privacy encroachment problems and literacy for media are the main barriers. Cultural, social, technological infrastructural and health system differences are likely to influence the relationship between mobile phone diffusion and health care was also opinedby (Haenssgenand Ariana2017) Keeping in mind the various factor used to evaluate whetherm-technology is able to influence healthcare facilities and whether the necessity of the usage is communicated to the youth. It can be noted that m-technology has reached the youth minds and able to influence the usage of healthcare facilities although there are discrepancies and varied notions about the usage is growing with time. It is found that m-technology for health care is accomplishment in the districts of Nadia and Birbhum. However there disappointment stories also were people are suspicious about the information being reaching to all, the privacy is encroached. Youth believe that usage of mhealth is a product of English literacy and affluent employment status. It is found that youth volunteered to disseminate the information of usage of m-technology among the family members and connection. The knowledge and awareness pattern towards technological usage of the youth is positive and can be future strengthen by suitable accessibility to infrastructural facilities.

CONCLUSION

Empowered with varioushealth apps or free motivational and wellness related health tips via text messages, the active consumers stayhealthy With the rise in mobile phone usage globally, today's patients and community healthworkers even in the remotest rural areas can be empowered with various preventive health care programsthrough innovative m-health text messages or mobile apps enabling them to modify unhealthy life stylepractices which are mainly responsible for major chronic non-communicable diseases. Sensitising the customerswith health care products and services helps them to demand for better health services andreduce the gap inhealth inequalities which exists especially among the rural population. Behaviour change increases theefficiency of treatment and outcomes for providers, thus reducing costs to health plans through increasedutilisation of preventive care. This way the community can produce youth who are healthy and productive, thusreducing the economic and social burden of the country. The acceptance and increasing utilization of technological innovation in health care are crucially beneficial for both health care professionals and patients during the diagnosis and treatment processes.

Suspicious and confidentiality and privacy are strong influencing factors for refusing m-technology usage for patients. Smart phones, which leads to changes in social lives, interpersonal relationships and even self – expression.(Livingstone, 2008) Gücina & Berk (2015). Thus in the districts of Nadia and Birbhum although the model of usage of m-technology in healthcare stands to successful still there a long way to go to accomplish a wider network which will help the youth to connect with the wider structure with many rural folks who are still victims of suspicious beliefs and value systems.

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