

AWARENESS AND ACCEPTANCE OF E- HEALTH IN INDIA

Unnati Bajpai and Rohan Ghatpande

M.B.A (Hospital Administration) 5-year program, Institute of Management Studies, DAVV,
Indore

Dr. Shine David

Assistant Professor, Institute of Management Studies, DAVV, Indore

ABSTRACT

The current healthcare setup has seen a prominent rise in today's technological explosion. However, this assistive relationship is yet to be defined and structured to prove its conduciveness to various parameters of national importance and universalize its applicability in everyday practice. The term e-health coined to define this relationship has been brought into study by researchers through evidence-based practices and evaluation techniques, scope of establishing such systems in developing countries and role of government in instrumentalizing these systems. The fact that individual differences and societal stature of people in terms of educational background can leave the intense activity in deep waters if left out of consideration. We use data gathered from a random set of population to analyse the extent of differences among educationally distinct groups with respect to various e-health initiatives and practices which are being adopted and attribute various reasons which can be accounted for. The study is implicative of difference in opinions in the three areas of knowledge, process and technology which hold the major share of success of e-health in India. The findings associated with this study is imperative of phasing in the concept of e-health on grounds of careful consideration and feasibility with regards to the requirements and perception of the Indian consumer.

Keywords: Web-based health, e-pharmacy, smart health, electronic health record

1. INTRODUCTION

As a part of the digital reform being carried out nationwide in India, various initiatives started by Ministry of Health and Family Welfare (MoHFW) have targeted the healthcare sector of the country. The Government of India has worked its way in implementing e-health services in India by investing in smart and adroit platforms like telemedicine, mobile applications, and cloud-based services to enhance and enrich the current process of health sector working. The Government has also started recognizing firms providing innovative solutions and competent

products and medical devices which potentially match the projected portfolio and requirements of this mega project. The application of Information and Communication Technology (ICT) in the field of healthcare has paved the way for the development of e-health services which can revolutionize the existing healthcare setup to a prospective extent as well as the provision of an integrated system can cater to the needs of all stakeholders. However, what needs to be seen is the expanse of reception at the hands of one of the prominent stakeholders- the common man. While there are some tech-enthusiasts and early adopters who are considering the idea as a healthcare service booster, there also exists a certain part of the population which has exerted a rather middling response ranging up to the extremes of repudiation. Currently, studies have implicated the various interventions, challenges and shortcomings prevalent but the promotional aspect has been left rather untouched. This research paper will define whether certain individual differences contribute towards the acceptance and sustenance of e-health services and smart health solutions among Indian consumers in a discursive manner.

2. LITERATURE REVIEW

India is the country where many basic health needs are still unmet and e-health has potential to improve quality of healthcare in India. Until now, the use of technology in health care was driven mostly by the assumptions about the benefits of electronic health (eHealth) and its effectiveness and efficiency. The previous study (Enam, 2018) to understand how the evidence of effectiveness and efficiency of eHealth can be generated through evaluation. The objective of the study aimed to understand how evidence of effectiveness and efficiency of e-health can be generated through evaluation. This study concludes that evidence-based evaluation can not only improve the quality but also can be beneficial in long term implementation of e-health in healthcare. To investigate the challenges of eHealth implementation in developing countries (Borketey, 2017). The reasons attributed to the various challenges in e-health implementation were identified as poor knowledge and lack of skills regarding ICT. The conclusion was counter-questioned about the ability of developing countries in appreciating the enormous remuneration requirements of e-health. To know the potential of eHealth in improving the quality of healthcare (Saberwal, 2014). The objective being the challenges faced by the healthcare programmes and the nature of their financing were stated. Government intervention was found to be impactful in making these programmes successful. To gather evidence on trends and uptake of the use of ICT for health (Ministry of Health and Family Welfare Government of India, 2009). Key objectives for Second Global e-Health Survey were to identify and analyse trends in uptake of e-health foundation policies and strategies, use of telemedicine solutions, legal and ethical frameworks of EMR, EHR, and more. The report was able to identify the greatest area of need for support to the country to enable further development through deployment of e-health and related services. However, the awareness, acceptance and understanding of e-health in public has not been discussed extensively. A vast array of programmes is being run but not promoted well which generates the need for more awareness among the public about e-health measures.

3. METHODOLOGY

The chosen research method for the undertaken study includes analytical algorithms and concepts namely factor analysis and one-way analysis of variance (ANOVA) and fact-finding technique, i.e. questionnaire consisting of self-administered statements.

3.1. Research objectives

- To know the level of awareness, acceptance and understanding of the field of e-health in India.

- To analyse the need for promotional strategies required to be taken by the Government for creating the targeted level of cognizance.
- To compare the existent differences in the act of accepting e-health measures over traditional methods among different literate classes.

3.2. Data collection & Screening

A systematic survey was conducted on a general set of population through random sampling consisting of a sample size of 234 and data was collected via a questionnaire consisting of self-administered parametric statements. The statements were supposed to be rated over Likert Scale of rating. There was a total of 25 statements recorded initially as variables. The analysis carried out was done on IBM SPSS Statistics 20 software to obtain the designated output. The demographic details have been stated below with distribution among different sub-categories mentioned.

Table 1 Demographic Details

N=234	
GENDER	
MALE	38.46%
FEMALE	61.53%
AGE	
UNDER 30	83.76%
31-40 Yrs.	6.83%
41-50 Yrs.	4.27%
ABOVE 50 Yrs.	5.12%
MARITAL STATUS	
UNMARRIED	80.77%
MARRIED	19.23%
FAMILY TYPE	
NUCLEAR	69.23%
JOINT	30.77%
EDUCATION	
HIGHER SECONDARY	11.53%
GRADUATION	55.12%
POST GRADUATION	33.33%
OCCUPATION	
EMPLOYED	40.17%
SELF EMPLOYED	14.10%
UNEMPLOYED	45.72%
INCOME PER ANNUM	
LESS THAN 50,000	49.57%
50,000-1,00,000	9.83%
1,00,000-1,50,000	5.12%

Awareness And Acceptance Of E-Health In India

1,50,000-2,00,000	4.27%
ABOVE 2,00,000	31.19%

The Cronbach's Alpha for 25 items came out to be 0.891. The value lies between the intervals of $0.9 > \alpha \geq 0.8$ which indicates good internal consistency. Hence the items taken that are meant to evaluate the same general construct yield similar scores.

Table 2 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.891	0.894	25

After data collection **Factor Analysis – Principal Component Analysis with Varimax Rotation** was administered for dimension reduction. The data of 25 variables was condensed into 3 factors which consisted of 17 super variables. The output of factor analysis is shown in the table given below.

Table 3 Factor Table

FACTOR WITH EIGEN VALUE	FACTOR LOADING	VALUE	% VARIANCE
Knowledge Based Component (Total Initial Eigenvalue 7.220)	Awareness regarding relation of health and technology.	0.592	16.243
	Usage of online services and mobile applications.	0.535	
	Use of websites in knowing health service provider.	0.611	
	Online medicines ordered are trustworthy.	0.534	
	Pharmacist's participation in improvisation techniques	0.528	
	Knowledge of benefits of e-health insurance	0.501	
	Awareness regarding patient centric and progressive care	0.575	
	Preferring e-health measures over traditional ones.	0.624	
Process Based Component (Total Initial Eigenvalue 1.558)	Process of double-checking prescriptions by pharmacists.	0.600	15.387
	Understanding of pan-India exchange of information.	0.562	
	Format standardization of EHR/EMR.	0.628	
	Impact of e-health measures on national economy.	0.717	
	Promotion of e-health measures.	0.703	
Technology Based Component (Total Initial	Use of internet for health-related information. Information from health portals and	0.781	8.985

Eigenvalue 1.376)	application servers.	0.549	
	Internet-based self-care and self-medication.		
	Pharmacist assistance prior consultation.		
		0.563	
		0.572	

4. FINDINGS AND DISCUSSIONS

The cumulative percentage of variance comes out to be **40.614%**. Further the factor loadings were subjected to One Way Anova over the educational backgrounds of individuals under consideration which yielded following interpretation stated as below.

There was not a statistically significant difference between group means of variables- Awareness regarding the relation of health and technology and educational backgrounds namely higher secondary, graduate, post graduate, determined by One Way Anova ($F_{2,122}=0.281$, $p=0.756$) as $p>0.05$ There was a statistically significant difference between group means of variables- Use of internet for health-related information and educational backgrounds ($F_{2,122}=4.619$, $p=0.012$) as $p<0.05$. On account of the analysis of usage of internet for obtaining health-related information with educational backgrounds, there was a statistically significant difference as the obtained P value <0.05 , hence the null hypothesis was rejected. The reasons behind the difference can be due to varying perceptions and knowledge of individuals about reliability of internet as an information source for health-related information due to the underlying authors and information origin and their authenticity, etc. Vast pool of information renders the internet as a source of information overload and overlapping information and hence questions its reliability. Design features of websites, presentation of web pages, attractiveness, use of graphic images and media, content presentation, etc. also leads to variations in the choices of different individuals in entrusting these web pages for its perceptive genuineness.

There was not a statistically significant difference between group means of variables- Information from health portals and application servers and educational backgrounds namely higher secondary, graduate, post graduate ($F_{2,122}=1.494$, $p=0.229$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Internet-based self-care and self-medication and educational backgrounds ($F_{2,122}=1.348$, $p=0.264$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Usage of online services and mobile applications and educational backgrounds ($F_{2,122}=0.320$, $p=0.727$) as $p>0.05$. There was a statistically significant difference between group means of variables- Use of websites in knowing health service provider and educational backgrounds ($F_{2,122}=3.656$, $p=0.029$) as $p<0.05$. On account of the analysis of website utilization for establishing first contact with healthcare service provider with educational backgrounds, there was a statistically significant difference as the obtained P value <0.05 , hence the null hypothesis was rejected. Differently educationally-placed individuals seem to establish contact with hospitals through different means namely, word of mouth, past experience, walk-in, geographical location, brand value, etc and this variation in turn holds an individual difference factor which can be reflected by the educational status of these individuals. How these people perceive and utilize hospital website services and how they link such services to process optimization is a thing of statistical delight. All said and done, the efficiency and safety and attractiveness of these websites can also be considerable factors, internet availability, network stability, server responsiveness are some other factors which can be highlighted as causes of variation.

There was not a statistically significant difference between group means of variables- Online medicines ordered are trustworthy and educational backgrounds namely higher secondary, graduate, post graduate ($F_{2,122}=0.539$, $p=0.585$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Pharmacist assistance prior consultation and educational backgrounds ($F_{2,122}=1.020$, $p=0.364$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Process of double-checking prescriptions by pharmacists and educational backgrounds ($F_{2,122}=0.483$, $p=0.618$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Pharmacist's participation in improvisation techniques and educational backgrounds ($F_{2,122}=0.151$, $p=0.860$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Knowledge of benefits of e-health insurance and educational backgrounds ($F_{2,122}=0.105$, $p=0.901$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Awareness regarding patient centric and progressive care and educational backgrounds ($F_{2,122}=2.860$, $p=0.061$) as $p>0.05$.

There was not a statistically significant difference between group means of variables- Preferring e-health measures over traditional ones and educational backgrounds namely higher secondary, graduate, post graduate ($F_{2,122}=0.622$, $p=0.539$) as $p>0.05$. There was a statistically significant difference between group means of variables- Understanding of pan-India exchange of information and educational backgrounds ($F_{2,122}=3.619$, $p=0.030$) as $p<0.05$. On account of the analysis of understanding the process of pan-India exchange of patient data and other vital information with educational backgrounds, there was a statistically significant difference as the obtained P value <0.05 , hence the null hypothesis was rejected. An upcoming discipline of pan-India exchange of information holds the key to service enhancement by centralizing patient information- demographic, patient history, diagnosis, past treatment routes and medication history, etc which can be accessed nationwide. The variation in responses can be attributed to variable projection of this concept practically by different individuals. As the concept is new, the very idea may be associated with the probable success potential and hence can be caught at opposite ends of the spectrum. Other reasons can be lack of awareness, cyber threats, penetration potential of this concept both physically and technologically which can be a thing of scrutiny among different educational statuses of individuals studied.

There was not a statistically significant difference between group means of variables- Format standardization of EHR/EMR and educational backgrounds namely higher secondary, graduate, post graduate ($F_{2,122}=1.353$, $p=0.262$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Impact of e-health measures on national economy and educational backgrounds ($F_{2,122}=2.280$, $p=0.107$) as $p>0.05$. There was not a statistically significant difference between group means of variables- Promotion of e-health measures and educational backgrounds ($F_{2,122}=1.015$, $p=0.365$) as $p>0.05$.

5. CONCLUSION

Information and communications technologies (ICTs) can play a critical role in improving health care delivery system, so in order to take digital India ahead, e-health would be a potential tool to ensure better quality of services. E-health has brought great advancement in health care industry across the globe. It has also replicated its enormous potential in India where the discipline strikes a new line in technology acquisition and reengineering of current processes as well as resource allocation. The example of Kerala also signifies the use of existing resources like Aadhar services to associate medical records linked to the unique identification number held by such mediums which envisages the possibility of hassle-free patient information access, cuts down on the initial investment and increases the consistency of healthcare services. With this research we have concluded that the level of literacy affects

the acceptance and understanding of e-health in India. The initiatives taken by the government have been prominent but have not been matched with the targeted levels of acceptance and willingness to adopt. Technological knowledge and skills are required for better understanding of e-health. For instance, the provision of a system of e-prescription in Delhi holds the key for monumental success in the area of smart medication but in turn greatly depends on technological knowledge inculcation and reduced public skepticism. It involves sharing of prescriptions electronically to connected pharmacies instead of physical notes which increases the speed and accuracy of information sharing, seamless transmission of critical patient data and medical history, medication management and integration with the electronic medical record (EMR) system. The relevance of Health ATMs as an emerging frontier, first established in the town of Dantewada, to enhance healthcare delivery has also been identified. These work as kiosks with integrated medical devices, lab facilities and emergency services along with connecting a patient to the concerned doctor through video-conferencing, digital devices and web-enabled applications. The other conclusion was that there is call for heavy promotion about e-health measures and their effectiveness in quality. This will make people aware about benefits of e-health measures over traditional methods and will help providers to deliver better health outcomes in terms of access, quality and affordability.

REFERENCES

- [1] Enam A, Torres-Bonilla J, Eriksson, Evidence-Based Evaluation of e-Health Interventions: Systematic Literature Review *J Med Internet Res* 2018; 20(11):e10971 <https://www.jmir.org/2018/11/e10971/#Discussion>
- [2] Jarosławski.S. Saberwal, G. In e-Health in India today, the nature of work, the challenges and the finances: an interview-based study. *BMC Med Inform Decis Mak* 14, 1 (2014). <https://doi.org/10.1186/1472-6947-14-1>
- [3] National Health Portal, India (2017), e-health India. http://nhp.gov.in/e-health-india_mty
- [4] Peter Elliot Borketey, A literature review on the challenges of e-Health implementation in developing countries among rural folks: A case of Ghana, 2017 <https://pdfs.semanticscholar.org/26b7/add64acdbd9c3145845758967a60b8b1a9af.pdf>
- [5] Bradford W. Hesse and Ben Shneiderman, eHealth Research from the User's Perspective. *Am J Prev Med.* 2007 May; 32(5 Suppl): S97–103. doi: 10.1016/j.amepre.2007.01.019 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1939873/#__ffn_sectitle
- [6] Kaplan B. Addressing organizational issues into the evaluation of medical systems. *J Am Med Inform Assoc.* 1997;4(2):94–101. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC61498/?report=reader>
- [7] E-Health initiatives in Gujarat. Gujarat hospital management information system-maintaining EHR of patients https://www.nhp.gov.in/e-health-initiatives-in-gujarat_pg
- [8] Chattopadhyay S. A framework for studying perceptions of rural healthcare staff and basic ICT support for e-health use: an Indian experience. *Telemed J e Health.* 2010;16(1):80–88. doi: 10.1089/tmj.2009.0081. <https://www.liebertpub.com/doi/10.1089/tmj.2009.0081>
- [9] Coiera E. Four rules for the reinvention of health care. *Bmj.* 2004;328(7449):1197–9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC411109/?report=reader>
- [10] Syed-Abdul S, Scholl J, Jian W-S, Li Y-C. Challenges and opportunities for the adoption of telemedicine in India. *J Telemed Telecare.* 2011;17(6):336–337. doi: 10.1258/jtt.2011.101210. <https://journals.sagepub.com/doi/10.1258/jtt.2011.101210>

Awareness And Acceptance Of E-Health In India

- [11] Jarosławski S, Saberwal G. Case studies of innovative medical device companies from India: barriers and enablers to development. *BMC Health Serv Res.* 2013;13:199–206. doi: 10.1186/1472-6963-13-199.
<https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-13-199>
- [12] Kuperman GJ, Bobb AM, Payne T, Avery AJ, Gandhi TK, Burns G, et al. Medication-related Clinical Decision Support in Computerized Provider Order Entry Systems: A Review. *J Am Med Inform Assoc.* 2006
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2215064/?report=reader>