Scope of E-Health growth in India

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Abstract—**Introduction to Study:** A revolution in health care is occurring as a result of changes in technology. A health care system consists of people, institutions, and resources that deliver health care services to meet the health needs of people. Electronic health (E-Health) is often defined as healthcare practices supported by electronic processes and communication. It includes mHealth, defined as the practice of medicine and public health supported by mobile devices. Today emergent technologies like the Cloud, IOT, Human Computer Interaction, Cyber security can be added to it along with Anthropology, public policy and public health medicine to make this service robust. In a country like India, it is observed that there is a great deal of disparity in the quality and access to the health care among the urban and rural regions. In the rural areas there is an acute scarcity of the health care specialists, health services and health care providers. **Research Methods and Approach:** The paper finds the challenges of implementing health services enabled by the mobile and other allied technology advancements. The challenges are to prevail, but the major ones can be addressed and recommended for mitigations. The research methodology includes qualitative approach with mixed methods of research. With an in-depth substantial systematic review, the paper proposes a conceptual framework from the study, analysis of current scenario, available data, software tools and relevant aspects of eHealth providers, case studies and literature review of eHealth in India. This can be treated as a support to formulizing and improving the current policy for National Rural Health Mission of India. **Purpose of the Study**
Healthcare as a domain is receiving a lot of attention for various reasons due to a)the huge amount of data and the huge variety of data generated in its transactional domain. b) due to which there is an interest generated by the software vendors for implementing their tools and targeting the hospitals as their clients. The purpose of the study is to be instrumental in helping to support the Improvement of E-health service in rural India by the use of mobile technology, which has a huge reach, even in rural India. The remote locations have issues like: less number of healthcare specialist, less number of medical equipment and other resources. The Rural Health of India has a special workforce created called as "ASHA" working in association with the Anganwadi workers. Their major objective is child birth, child health and women. The paper discussed the probability of addressing the other seasonal diseases like swine flu, dengue, viral fever, contagious diseases and also the treatment of the elderly and cases of emergency like accidents and heart attacks with the help of the proposed framework. **Results/Findings & Interpretation**: The paper does a gap finding in implementation of E-Health in its variants like telemedicine, mhealth applications and maps the gap to a possible solution in the rural health care domain. It analyses various eHealth providers from software as well as users, usage, ROI social perspective and their pros and cons as well as lacunas. It analysis the gap from literature, case studies and formulates a conceptual framework for eHealth, which will be the beginning for the future work of implementers of eHealth providers ahead. The paper provides guidelines, Do's and Don'ts with respect to the existing gap found for the eHealth services and users perspective. **Implications: description of main outcomes of the study** a)The paper helps to address the manpower shortage in rural regions which are deprived of hospital services. b) Can help better care of elderly patients and emergency cases c) Can provide a substantial support the for seasonal change diseases and d) Can help to improve the Hospital service in general. **Originality/Novelty**: The literature review proved that the concept of the paper is original. There have been papers on this subject, found in the literature review. But they fail to give a one-to-one solution or discuss the solutions in this detail.

Keywords—eHealthCare, India, Rural, ASHA, HealthCare Issues,

Introduction

At the International Congress on Telemedicine and Telecare in London, 1999, John Mitchell from Australia, talked giving a reference of a government study. The major outcome of the study was an acknowledgment of the following fact "cost-effectiveness of telemedicine & telehealth can multiply significantly when it is a part of an integrated application of technology in." Della (2001). This in turn steered to the identification of "e-health" as an umbrella term, with definitions such as "a new term needed to describe the

combined use of electronic communication and information technology in the health sector... the use in the health sector of digital data - transmitted, stored and retrieved electronically - for clinical, educational and administrative purposes, both at the local site and at distance" was coined. Mitchell (2000)

Ehealth is electronic health. Today the term has undergone further expansion with the introduction of the telecom industry and mobiles. Having a subsect termed as mHealth. It is defined as an application using the mobile, network and internet technology in health care. It has further garnered more importance due to the innovative use of sensors, several sensor enabled devices and the notion of Internet of Things(IOT) and wearable devices hitting the markets. These applications are as of today very new and yet have to show the normal graph of growth. But they are making waves globally.

But it is important to consider the great potential in the implementation of E-Health a.k.a mHealth in Indian health care domain especially rural India. Earlier to this there was a wave of telemedicine, which was not successful in its implementation it the health care practices and domain. One of the reasons was that the interdependencies of human with technology along with the parallel impact of socio-economic environment, behavioural tendencies and financial sustainability were mostly assumed and majorly dis-regarded. At least now, a holistic approach is required for the development of Ehealth-mhealth in India, specifically Rural India.

Most health programs consist of three generic functions – i) delivery that involves the medical practitioners and health workers to conduct diagnosis and provide care, ii) promotion to create awareness among the target audience and help them adopt target healthy behaviors and iii) monitoring and evaluation to improve the delivery and promotion functions. Garai(2011).

I. LITERATURE REVIEW

Agrawal et. al (2013) discussed about the limitations in implying E-Health and also the creation of Electonic health Records(HER).The authors underline the lack of in infrastructure and transparency in functionality as the reasons for the failure of bridging the gap in health care and telemedicine.

Meher et.al discussed the awareness and attitudes of various stakeholders of healthcare towards Telemedicine. Most Doctors across age groups were in favour of this concept so we can also say that they will be in favour of e-Health. Most patients or general public is not aware of telemedicine or ehealth.But the people who had used telemedicine were satisfied about the service.

Jarosławski, S., & Saberwal, G. (2014) in their paper suggested from their findings that It was unlikely that eHealth will have widespread and sustainable impact without government involvement, especially in rural areas. Nevertheless, programmes run solely by the government are unlikely to be the most effective.

Mechael, P et. al (2010) examines the existing mHealth policy environment, barriers and gaps, and key drivers needed for an enabling policy environment to help accelerate mHealth.

Chattopadhyay, S. (2010) in his paper found shows that basic ICT for support at the organizational levels is significantly lacking to implement e-health in these PHCs, although healthcare staffs are ready to use it. Proper measures have to be adopted mostly at the organizational level, such as improving basic ICT support before what will in all probability be a successful implementation and practice of e-health in Indian PHCs.

Mishra, S. K(2009) et. al. in their paper discussed various measures, policies taken by the government and the earlier situation for implementing telemedicine.

Athavale, A. V., & Zodpey, S. P. (2010), in their paper discussed the scope, the limitations, and future perspective of e-health discipline in context to India. It also highlights information and technology related tools namely Geographical Information Systems, Telemedicine and Electronic Medical Record/Electronic Health Record. India needs to leverage its "technology" oriented growth until now

K. Ganapathy , M. Ch , Aditi Ravindra (2008) discussed mHealth as the application of emerging mobile communications and network technologies for health care systems. It involves the use of mobile computing, medical sensors, and communications technologies for health care.

Jones, C. Ret. Al.(2010) The purpose of this paper is to present the background to, and results of, a multidisciplinary eHealth assistance project in a remote region of the Brazilian Amazon, highlighting the importance of citizen participation within planning processes.

The paper has highlighted fundamental healthcare tasks difficulty to reach due to high population and geography, varied in socioeconomic cultural aspects. The need of healthcare is a rampant global issue.

It has indicated need of Telenursing for better healthcare in communities. The paper underlines need of accessibility and consumption of the healthcare service categories, workforce enabling the healthcare and features impacting healthcare needs in less privileged communities. It highlights necessity of telenursing integration at skilled and systemic level. The existing study of healthcare system shows inadequate scope of healthcare services. Absence of eHealthcare services direct the patients to go to traditional healthcare system due to the gravity of importance to the healthcare problems. There is a need of improvement in clincical diagnosis of chronic diseases cost reduction in longer treatments, reduction in time delayes for healthcare benefits[2]

The component of tele-education has been the most popular amongst the clinicians' right from the beginning, other applications of telemedicine are gaining momentum. Owing to larger scope of applications in developing countries, telemedicine may have more impact there4. Telemedicine being a multi-disciplinary domain and needs fields like medicine, ethics, science, computers and ecommerce to converge. Convergence at this scale in a developing country may not be an overnight change, as it needs synergetic efforts from all perspectives. The development and implementation of telemedicine technology are pre-requisites for introducing telemedicine into a developing country, but some other post implementation challenges like grooming a forward looking charismatic and energetic IT-aware clinicians, behavioral change, infrastructural preparedness, [3].

B. Current Scenario of HealthCare Statistics in India

No. of ASHA workers state wise :

NATIONAL HEALTH MISSION Status as on 30th June

No of ASHA workers	Total	Andhra Pradesh	Goa	Gujarat	Haryana
2018-19	986	0	0	159	0
Karnataka	Kerala	Maharashtra	Punjab	Tamil Nadu	Telangana
176	0	249	180	0	0
West Bengal	222				

No. of Anganwadi workers

The number of operational Anganwadi Centres in India was 1349091 as on 31.12.2015. The top 10 States/UTs in terms of the number of operational Anganwadi Centres were: Uttar Pradesh, West Bengal, Maharashtra, Madhya Pradesh, Bihar, Odisha, Karnataka, Assam, Rajasthan and Andhra Pradesh as on 31.12.2015.(https://community.data.gov.in/operational-anganwadi-centres-awcs-as-on-31-12-2015/)

State wise distribution of Mobile usage no.s

Mobile Telephone Subscribers as on 29.02.2016
Updated on March 21, 2017 The total number of mobile telephone subscribers in all the 22 Licensed Service Areas (LSA) in India was 1027166644 as on 29.02.2016. There were 10 Licensed Service Areas having more than 5 crore mobile telephone subscribers each viz. Uttar Pradesh (East), Maharashtra, Tamil Nadu, Andhra Pradesh, Bihar, Madhya Pradesh, Gujarat, Karnataka, Rajasthan and Uttar Pradesh (West) as on 29.02.2016.(https://community.data.gov.in/mobile-telephone-subscribers-as-on-29-02-2016/)

Subscribers With 2g/3g/4g
Telecom Regulatory Authority of India
The Indian Telecom Services Performance Indicators April - June, 2017 New Delhi, India 28th September, 2017; Telecom Subscribers (Wireless +Wireline) Urban Subscribers 700.96 Million, Rural Subscribers 509.88 Million; Wireless Subscribers Urban Subscribers 680.66 Million, Rural Subscribers 506.18 Million; Wireline Subscribers Urban Subscribers 20.31 Million, Rural Subscribers 3.69 Million
During the Q.E. June, 2017, total wireless data usage was 4,206,415 terabytes. Out of which, 2G data usage was 100,390 terabytes, 3G data usage was 690,743 terabyte, 4G data usage was 3,999,012 terabytes and CDMA data usage was 16,270 terabytes.
(https://trai.gov.in/sites/default/files/Performance_Indicator_Reports_28092017.pdf)

C. Current Scenario of various HealthCare aspects in India

India is a very vast country with complex socio-economic-cultural characteristics that are reflected everywhere, even in its medical systems. Unfortunately even today, there are insufficient Health care personnel, which include doctors,

nurses, and other healthcare workers. Rao. M et. al(2011) This is with due data more focussed on the rural and semi urban areas in India. Almost about 80% of the population depends on non-allopathic medicine. Gogtay et. al(2002).The Non-allopathic treatment involves Ayurveda, yoga and naturopathy, unani, siddha, and homoeopathy (AYUSH). With the healthcare professionals in the rural and semi-urban part of India, there are few more problems adding to the troubles. One is of keeping themselves knowledge-updated, updated to the changes happening globally. Another problem is many healthcare professionals lack formal qualifications.

A study of the Indian pharma industry has estimated that the penetration of modern medicine in the country is only 30% Annonymous (2007). Adding to the problems, the treatment costs also include the travel costs in all regions, urban, semi-urban and rural. Almost 70% of the population in rural regions have limited access to adequate health care.

The use of Information and Communication Technologies (ICT) for health (eHealth) has the potential to improve all the above discussed problematic areas and thus facilitate access to better quality health care, more relevant health related information to some extent. It can also give an additional advantage of creating, managing and improving the quality of health-related data. The ICT enabled eHealth delivery of health-related services can also involve remote clinical participation in few given conditions that can involve mobile technology.

The Government Initiatives:
The government of India has been proactive and has taken many steps to foster the rural health care domain.
The National Rural Health Mission(NRHM) was launched on the 12th April 2005. Its objective is to provide effective, efficient and affordable health care to the rural population in eighteen states with weak public health indicators.
One of the key components of the mission is to provide every village in the country with a trained female community health activist –The ASHA or the Accredited Social Health Activist. The Asha is considered the first station for any and all health related demands to access health services in the given area of rural India. The other responsibilities include creating awareness amongst the community towards health , its determinants, local health planning, utilization and accountability of existing health services.
With the sixth year of implementation of NRHM in the state the strategies to strengthen the ASHA programme year after year has always been a continuous effort.
The other component of the NRHM is the Auxiliary nurse midwife, commonly known as ANM. It is a village level female health worker and regarded as grass root workers. It's their responsibility to provide safe and effective care to communities.
Initially, i.e. 1950-1960 the ANM were focused on midwifery, mother and child health. In 1970s their role changed and combined other functions of health services. In 1975, their role was not only maternity and child care but also primary curative care of villagers. In 2005 , Post NRHM their role became crucial and they provided an important link between health services and the community, working together with ASHA.
Relationship with ASHA

Depending on the area covered by the sub-centre, each ANM is supported by four or five ASHAs. ANMs are supposed to take weekly or fortnightly meeting with ASHAs to review work done the last week or fortnight. The ANMs guide ASHAs on aspects of health care.

The Anganwadi Worker (AWW) is third component of NRHM. They act as training persons of ASHAs. The ASHA act as bridge between the ANM and the village.

Anganwadi is a type of rural child care centre in India. They were started by the Indian government in 1975 as part of the Integrated Child Development Services program to combat child hunger and malnutrition.

Pilot projects:

There are some pilot projects supported by the government. There are few active mHealth pilot projects in India carried out by some state governments and NGOs as part of an mGovernance initiative.

The Projects include use of mobile games to enhance disease awareness, use of handheld devices to collect raw health data which were transmitted in real time to the Health Information System Database. Some applications are used to send daily health alerts and to track Disease and Epidemic Outbreaks.

Key applications of mHealth include education and creating awareness, remote data collection, communication and training for healthcare workers, disease and epidemic outbreak tracking, diagnostic and treatment support and remote monitoring, access to technology, end user and health care provider acceptance, lack of regulatory issues, logistics and availability of appropriate, need-based, customised solutions are some of the other challenges. (https://www.asianhhm.com/technology-equipment/mhealth-poised-growth-india)

Awareness and attitudes towards Telemedicine

Various studies show the awareness and attitudes of various stakeholders of healthcare towards Telemedicine. Most Doctors across age groups were in favour of this concept so we can also say that they will be in favour of e-Health. Most patients or general public is not aware of telemedicine or ehealth.But the people who had used telemedicine were satisfied about the service.Meher et. al(2009)

Growth of Mobile usage in Rural India:

Size of rural marketing in India

Rural marketing grew by 10-12% in FY17 over FY16

Digital media outpaced traditional forms, growing 50% in FY17 over FY16. Rural markets account for 60% of the new mobile subscription growth India to reach 1.2 billion mobile subscribers by 2020. Ad spends on mobile form more than half of the estimated Rs 7,300 cr digital media ad spends (Source: Zenith and Performics.Resultrix)

Fig: Source : TRAI

Challenges in Rural India Health:

The Challenges in deploying mHealth include changing the mindset of the people, convincing them with large success stories, providing education, training, providing solar units for power to charge their mobiles and making available appropriate, cost effective, need based, Value Added Services.

E-Health should be ideally delivered in combination with other Services including ECare, EServices, ESurveillance and ELearning. The fruitful result from EHealth will depend on creating the right 'fit' between EHealth applications and healthcare needs; in other words EHealth should be need-driven not technology-driven.(https://www.asianhhm.com/technology-equipment/mhealth-poised-growth-india)

IV. SEMI-STRUCTURED INTERVIEW FOR HEALTHCARE END USERS

THE QUALITATIVE RESEARCH METHODOLOGY BASED SEMISTRCUTURED INTERVIEW

The purpose of conducting the semi-structured interview was to get a preliminary understanding of views examined persons who are interviewed are stakeholders for the healthcare systems. Individual face-to-face in-depth interview, which seeks to foster learning about individual experiences and perspectives on a given set of issues.

Selecting interviewees

In-depth interviews are used to discover shared understandings of a particular group. The sample of interviewees should be fairly homogenous and share critical similarities related to the research question. Selecting in-depth interview participants is based on an iterative process referred to as purposeful samp- ling that seeks to maximise the depth and richness of the data to address the research question. used in-depth interviews about perceptions of caring for elderly and other patients with healthcare experiences, expectations, existing issues faced. The data were further enriched by carrying out some interviews, performing preliminary analyses, and then selecting more respondents to fill in emerging questions. We selected purposive sample of 30 interviewee for this healthcare facilities related from rural aspect to examine, the current issues in this area and eHealth needs and gap finding perspective.

The Results of the Semistructured Interview data when analysed clearly indicate current issues in healthcare sector as indicated by interviewee and give us direction for the significant need of eHealth facility to be created in future.

Result of Semistructured Interview Data and Analysis:

Question_No.	Interview Questions based on Issues in Healthcare	Data Result, Analysis of Respondents Responses
1	Your opinion about adequate healthcare in rural India in 2018.	In-Adequate 72%
2	Rate the healthcare facility in Rural India on a Likert scare of 5	V poor 69 %
3	Rate the availability of doctors in rural India on a Likert scale of 5	V poor 73 %
4	Rate the quality of doctors available in Rural India on a Likert scale of 5	Nominal 58 %
5	Rate the availability of Nurses in rural India on a Likert scale of 5	Nominal 38 %
6	Are Medical Shops located at regular distances in rural India? a) Yes b) No	No 83%
7	If they are ,rate the availability of Medicines at such shops on a scale	V poor 51%
8	Are any other medical practitioners available in rural india? (Ayurveda, yoga and naturopathy, unani, siddha, and homoeopathy (AYUSH)) a) Yes b) No	Yes 66 %
9	How do people face medical emergencies in Rural India?	Emergency can be many times fatal due to lack of healthcare infrastructure, HR, medico facilities, ambulances, medicines, doctors not present, surgery, operation theatres not available, no diagnosis, no first aid, severe treatments, no emergency units available
10	Can E-health resolve some issues to healthcare? Your opinion a)Yes b) No	Yes-61%
11	Are you comfortable with the notion of telemedicine or doctor on phone for a first time medical counsel? a)Yes b)No	No- 59%
12	Are you comfortable with the notion of telemedicine or doctor on phone for a Follow-up advice and medical counsel? a)Yes b)No	Yes 72%
13	Would you like to pay for an E-health centre for and in rural India? a)Yes b)No	Yes 56%
14	How much can you like to pay for such a service? Would you like to pay for multiple times in a fin year Yes – If Yes, What Amount (In INR) 100,	Average – 62 % said Yes Yes – 100 INR – 31 % 500 INR - 49 % 1000 INR -
	500, 1000. No	20%

V. ANALYSIS AND OUTCOME

Based on thorough literature review, preliminary responses from semi structured interviews of 30 respondents for Health care issues and if any indication of eHealth, have derived us to propose the following:

Ways to Address the Challenges in Rural India Health: Proposals for funding options
a) The mobile bill can be calculated for use of E-health Infra
b) Have a fund generated for every village by collecting nominal money from people monthly. Utilizing this for building up healthcare and E-health infra
-proposals for increasing the human support to the current system
a) Adoption of Rural Villages by Doctors with granting due incentives to them
b) Adoption of Rural Villages by Corporate houses with granting due incentives for them
c) Adoption of Rural Villages by private and government Educational Institutes
d) Increasing ASHA workers.
e) Creating another worker keeping in mind the home keeper house wife and training them.
f) The Bacchat Gat group can also be considered.
g) Constituting a cohort of medical practitioners from AYUSH for each village or 1000 people. Each cohort to have 2 people from each specialization. Connecting this cohort to the NRHM.
Method of operations (modus operandi)
The objective of E-Health can be to address the critical, medical emergencies. The follow up of any major illness, surgery, controlling the outbreak of seasonal diseases, creating general awareness about primary healthcare.
The major resource to be used is Mobiles and the existing Health centres.
A cohort of medical practitioners practicing any of the AYUSH (Ayurveda, yoga and naturopathy, unani, siddha, and homoeopathy),for each village or 1000 people to be created. Each cohort to consist minimum of 2 people from each specialization. Finally ,Connecting this cohort to the NRHM.
The government needs to brainstorm and advertise the urban, allopathy doctors to adopt 500-1000 villagers and plan visits at least once in a month. Similarly the corporate players need to be confided. The Educational institutes can also be pulled into creating a larger cohort.
A schedule will be generated considering all these components to periodically visit the rural regions.
Proposal of Conceptual Frame Work:
Proposal of centralized electronic health records of all citizens: on the lines of NAD (national Academic Depository). National Academic Depository (NAD) is an initiative of Ministry of Human Resources Development, Govt. of India (MHRD) to facilitate digital issuance, storage, access and verification of Academic Awards issued by Academic Institutions. NAD is a Unique, Innovative and

Progressive initiative under "Digital India" theme towards achieving Digital enablement of the Education Records.

NAD aspires to make the vision of Digital Academic Certificates for every Indian a reality. This touches the lives of Indian youth and empowers them with Digital, Online, Trusted, Verifiable Certificates which are accessible in a secure manner at all times. NAD promises to do away with difficulties / inefficiencies of collecting, maintaining, and presenting physical paper certificates.(https://nad.ndml.in/about-NAD.html)

Applying the theory of disruptive innovation and it can be matched with innovative business model like rural health care

The theory of disruptive innovation helps explain how complicated, expensive products and services are eventually converted into simpler, affordable ones. The model puts in theory the performance of a product or service, which gradually improves over time. There is continual improvement of a product or service that is introduced by companies over a period of time. These innovations can be either small and incremental or dramatic breakthroughs. These are generally termed as "sustaining innovations" because they sustain the existing trajectory of performance improvement. This results in better products/services and which could be sold with higher profits to best customers.

When companies upgrade their products with features much more quickly than most customers can use them. And when products begin to pack in more functionality than customers need or desire, a different type of innovation occasionally emerges a disruptive innovation. In complete contrast to sustaining innovations a disruptive product is actually not as good as what existing customers are already using, and hence it does not appeal to many customers in the existing market. However, because the new product is usually simpler, more convenient, and more affordable, it enables the participation of a new set of customers who were previously ignored by the market or shut out completely. Applying the E-health in rural India can be on the lines of this disruptive innovation model. User/ stakeholders networks will help shift much of the care of patients out of the intuitive-based practice of hospitals, physician or e-health practices, whose business models are poorly equipped to meet the needs of these people. Similar to value-adding process hospitals, physicians or e-health practices that can perform procedures with higher quality and at dramatically lower cost than traditional hospitals, user-network businesses will also improve the quality and reduce the cost of care for many diseases.

Diagrammatic Representation of Proposed ehealth architecture: It will include following components

Rural Health Mission of India
-ASHA
-Anganwadi Worker
-AnW

It will have Support System constituents as follows:

-Government and Private Schools
-Corporate Houses in that region
-Doctors

II. CONCLUSION

Many eHealth technologies are not successful in realizing sustainable innovations in health care practices. One of the reasons for this is that the current development of eHealth technology often disregards the interdependencies between technology, human characteristics, and the socioeconomic environment, resulting in technology that has a low impact in health care practices. To overcome the hurdles with eHealth design and implementation, a new, holistic approach to the development of eHealth technologies is needed, one that takes into account the complexity of health care and the rituals and habits of patients and other stakeholders.

One of the main reasons for failure of any technological deployment is disregarding the interdependencies, i.e. the cohesion and coupling of all the said stakeholders. Here the stakeholders are technology, human, his social, cultural, economic environment. To overcome the hurdles with eHealth design and implementation, a new, holistic approach to the development of eHealth technologies is needed, one that takes into account the complexity of health care and the rituals and habits of patients and other stakeholders.

The research also shows that people are ready for accepting and trigerring changes.It cannot be only government or only private players, but the combination which can help healthcare in rural India.

REFERENCES

[1] van Gemert-Pijnen, J. E., Nijland, N., van Limburg, M., Ossebaard, H. C., Kelders, S. M., Eysenbach, G., & Seydel, E. R. (2011). A holistic framework to improve the uptake and impact of eHealth technologies. Journal of medical Internet research, 13(4).

[2] Della Mea, Vincenzo (22 June 2001). "What is e-Health (2): The death of telemedicine?". Journal of Medical Internet Research. 3 (2): e22. doi:10.2196/jmir.3.2.e22. PMC 1761900. PMID 11720964.

[3] Mitchell J. Increasing the cost-effectiveness of telemedicine by embracing e-health. J Telemed Telecare 2000;6 Suppl 1(6 Suppl 1):S16-S19. [Medline] [CrossRef]

[4] Garai, A (2011). Role of mHealth in rural health in India and opportunities for collaboration. In, ICCP Technology Foresight Forum: Developments in Mobile Communication, Paris, 26 October 2011. 5 pages

[5] Jarosławski, S., & Saberwal, G. (2014). In eHealth in India today, the nature of work, the challenges and the finances: an interview-based study. BMC medical informatics and decision making, 14(1), 1.

[6] Rao M, Rao KD, Shiva Kumar AK, Chatterjee M, Sundararaman T: Human resources for health in India. Lancet. 2011, 377 (9765): 587-598. 10.1016/S0140-6736(10)61888-0.

[7] 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. 10.1258/jtt.2011.101210.

[8] Das J, Holla A, Das V, Mohanan M, Tabak D, Chan B: In urban and rural India, a standardized patient study showed low levels of provider training and huge quality gaps. Health Aff (Millwood). 2012, 31 (12): 2774-2784. 10.1377/hlthaff.2011.1356.

[9] Gogtay NJ, Bhatt HA, Dalvi SS, Kshirsagar NA: The use and safety of non-allopathic Indian medicines. Drug Saf. 2002, 25 (14): 1005-19. 10.2165/00002018-200225140-00003.

[10] Annonymous: Analyzing the Indian pharmaceutical industry. Aruvian Research (Market Research Report). 2007

[11] Agrawal, A., Bhattacharya, J., Baranwal, N., Bhatla, S., Dube, S., Sardana, V., ... & Brahmachari, S. K. (2013). Integrating health care

delivery and data collection in rural India using a rapidly deployable eHealth center. PLoS medicine, 10(6), e1001468.

[12] Meher SK, Tyagi RS, Chaudhry T: Awareness and attitudes to telemedicine among doctors and patients in India. J Telemed Telecare. 2009, 15 (3): 139-141. 10.1258/jtt.2009.003011.

[13] http://nrhmmeghalaya.nic.in/asha#maincontent

[14] http://nhm.gov.in/communitisation/asha/about-asha.html

[15] http://vikaspedia.in/health/nrhm/national-health-mission/national-health-mission

[16] https://www.asianhhm.com/technology-equipment/mhealth-poised-growth-india

[17] https://www.asianhhm.com/technology-equipment/mhealth-poised-growth-india

[18] Journal Of The International Society For Telemedicine And Ehealth Telenursing - A Potential Resource In The Ehealth Agenda Of India Suman Bala Sharma Sharma Sb. J Int Soc Telemed 2014;2(1):19-28

[19] Journal Of The International Society For Telemedicine And Ehealth Telenursing - A Potential Resource In The Ehealth Agenda Of India Suman Bala Sharma Sharma Sb. J Int Soc Telemed 2014;2(1):19-28

[20] Ehealth: India, Implementing Telemedicine

Technology: Lessons From Indi

Sanjay P Sood

[21] Public Health Informatics In India: The Potential And

The Challenges *A. V. Athavale1, Sanjay P. Zodpey2

The Current Status Of Ehealth Initiatives In India

Saroj Mishra, K. Ganapathy, Baljit Singh Bedi

Special Issue: Ict And Societal Challenges

[22] Combating Infant Mortality In Rural India:

Evidence From A Field Study Of Ehealth

Kiosk Implementations, Viswanath Venkatesh,

Arun Rai, Tracy Ann Sykes And Ruba Aljafari