



A Literature Review of E-Health and its implication on India.

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Abstract

Health sector has progressed significantly in accordance to electronic health (eHealth) arrangements which utilizes health inputs (e.g., information, medicine etc) and health care by electronic means. E-Health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. The purpose of the study is - firstly, to present an overview of E health in the health care sector; secondly, to understand the role of e health in providing solution to various healthcare challenges; and third, to understand emerging health care strategies and emerging eHealth solutions and its implication in Indian context. A systematic literature review was conducted to explore the role of eHealth in the health care sector. Various search engines like Google Scholar, Science direct, pubmed, Springer and Scopus for the published papers that addressed the role of e health in providing solution to various healthcare challenges. A qualitative analysis of the selected papers was conducted in several steps. E health is boon to address the healthcare need of the ever expanding population, however adequate policy intervention is required so that it reached in the periphery where healthcare infrastructure is not developed fully.

Introduction

The challenges that new healthcare systems have to face include the rising demand for health and social services, due to an ageing population and higher income and educational levels. In the present scenario it becomes a frustrating exercise for a patient to physically visit the doctor by traveling long distances under bad traffic or weather conditions. In the Indian scenario, one has to wait in long queues to get advice. Also, patients may contract infectious diseases in waiting rooms. By utilizing E-Health, patients can get treatments sitting at their home without going through all tedious exercises. E-Health services may be easier to access than traditional services in remote and rural areas and reduce the time spent by users on travel and appointments. It may be easier to offer the services to many people at a low cost. The eHealth technology is considered as a system in which in order to deliver efficient patient record keeping system, streamlined operations by coordinating the activities of the various departments of a hospital into a single repository unit and by so doing, enhanced administration and proper control.

The term eHealth was acquainted with in the 1990s; however, it was hardly in use until 1999. According to Eysenbach: “e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies”

E - Health stands for more than internet and medicine. E Health was used as the broadest umbrella encompassing everything that comes within information and communication technology and health care, including telemedicine, mobile health, and health informatics. e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. India, like most other developing nations, is facing several public health challenges like communicable diseases, malnutrition, and cardiovascular disorders. The diversity and heterogeneity of basic facilities and health care delivery mechanisms in different parts of this vast country is an area of concern for any nation-wide program.

E-Health has expanded from web-based services to mobile E-Health apps, online video services, and social media, and new services and technologies are constantly being presented. A few examples of E-Health services that are already in use in many countries around the world are online consultations, electronic patient records, digital radiological systems, decision-support tools, self-help apps, telemonitoring, and E-prescriptions.

Objective

The objective of the study was to elucidate overview of E health in the health care sector, to comprehend emerging health care strategies and emerging eHealth solutions and its implication in Indian context and to understand the efficacy of e health in providing solution to various healthcare challenges. Subsequently, a literature review was conducted to understand the evaluation process regarding both theories of eHealth and the practices in case studies of various eHealth interventions. A broader perspective was kept at the beginning of the review process in order to achieve the research objective. As the study progressed, the research objectives were refined, and the research questions were formulated. However, the objective was always to understand the role of eHealth in present health care sector from a comprehensive perspective. It was pertinent to recognize the emerging health care strategies and emerging eHealth solutions and its implication in Indian context and the aspects of effectiveness and efficiency that are evaluated during such interventions.

The research questions were as follows:

1. How is the emergence of E health has changed the health care sector and healthcare delivery as a whole?
2. What is the role of E health in providing solutions to various health care challenges?
3. to understand to understand emerging health care strategies and emerging E Health solutions and its implication in Indian context

Method

Identification and Screening of Research Articles

A systematic search of relevant E health articles was conducted following preferred reporting items for systematic reviews. Google Scholar, Science direct, pubmed, Springer and Scopus were used to search the following identified terms, “E health care strategies”, “E Health interventions”. “E Health solutions”, “E Health,” “healthcare challenges” and “E Health and India”. Scientific papers published between 2002 and 2019 were included in the review. A total of 2674 records were found with these selected search keywords. The screening of the papers was conducted in the following steps. For the first steps, the screening was based on the title of the article using a predefined set of exclusion and inclusion criteria. Only scientific papers were used, whereas books and reports were excluded during the search. In addition, studies addressing specific health problems pertaining to a definite clinical research questions were excluded. At this point, all the articles were listed, and duplicate records were excluded. During the second step, title screening was conducted. Only the most suitable, recent and original articles were retained for the review. A total of 22 articles was retrieved and carefully reviewed.

Review

E health – the way forward

Diaz J et al in 2002 suggested that the primary care provider should identify that patient are using the cyberspace as a source of medical and health information and should be equipped to offer suggestions for web-based health source and to contribution towards patients in assessing the quality of medical information. According to *Andreassen et al in 2007*, the greatest common way to use the Cyberspace in health matters is to read information, second comes using the net to decide whether to see a doctor and to fix for and follow up on doctors' schedules. They further concluded that, health-related use of the Cyberspace does affect patients' use of additional health services, but it would appear to enhancement rather than to substitute other health services. *Hamid et al in 2017*, stated that E Health has the potential to resolve health disparities, and as a result, lead to health justice. However, it is essential that governments and health policy makers provide some measures to diminish major barriers facing society, especially the elderly, the poor, the uneducated, and the disabled when implementing it. This can result in attaining the advantages of eHealth for establishing health equity.

E health policy

Hordern et al in 2011, suggested that it is imperative for the Policy initiatives to provide a comprehensive framework, which can make sure that these broad-ranging consumer E-health services will be effectively, efficiently, and safely accessed. *Serena et al in 2016*, emphasize the need for a more all-inclusive view of patient needs and priorities to directly involve them in the management of their care and to better shape E-Health policies. *Bassi et al in 2018*, highlight that there is an urgent need for focused research aimed at generating high-quality evidence on efficacy and user suitability of m-Health interventions aimed toward

healthcare systems consolidation considering background factors. They further concluded that it is pertinent to have well-designed, cost-effective studies to help policy makers use the limited healthcare budgets to ensure widespread health benefits.

Changes in healthcare delivery system with E health

Gracia et al in 2014, They suggested that the telemedicine system can significantly advance the level of medical care provided to patients and reduces the seclusion of field doctors in their practice. They further concluded that privacy and security of communication regarding patient information provided through telemedicine should lead healthcare organizations to consider using this as their sole method of communication with the field with regards to patient information. *Anantha et al in 2015*, suggested that the use of mobile technologies could marginally improve compliance in the target population, even if they do not affect the overall immunization rates. The evidence also shows that incorporating this scheme into an existing health system requires a small investment that could potentially result in sizeable gains in reducing infant and neonatal mortality and morbidity, particularly in resource-limited settings.

Shortcoming and barriers in E health implementation

Korp et al in 2006, stated that the disempowering features of health on the Internet are that it widens the gap between 'information-rich' and 'information-poor' users, thus reproducing prevailing social separations, and that the rise in medical and health results in increased worry and inferior health. The health promotive and empowering policies are focused at firming people's capability to evaluate dissimilar data bases in relation to their own welfares and desires rather than in relation to systematic and/or professional values. *Smith et al in 2015*, suggested that, mHealth may be a feasible way to target the current challenges of poor lifestyle and patient education in rural India. Complementary mHealth services may reduce high risk factor prevalence in this setting through health promotion and improved measures of primary prevention. Development of future uses of mHealth must address the barriers put forward by physicians in order to gain further support for its implementation. *Zaya et al in 2016*, concluded that it is the need of the hour to instruct and train the teaching professionals, working doctors, residents, medical scholars and other health experts about E health, telemedicine and matters associated to its use.

Emerging health care strategies and Emerging E Health solutions

Meher S K et al in 2009, concluded that proper hospital exercise programmers should be prepared for all doctors, which can assist in forthcoming utilization of telemedicine. Further awareness programmers also are mandatory for patients. Also, *Wen et al in 2010*, recommended that to encourage Individual Health Records implementation, the digital division allied with the gap in health learning must be enhanced, and cultural matters and the doctor-patient connection need to be studied. Further work also needs to discourse consumer worries concerning the safety of Health information Exchange. *Black et al in 2011*, suggested that in order to assess the impact of E-Health solutions on the quality and safety of health care, and to inform policy decisions on E-Health deployments. They suggested that, it is vital that future E-Health technologies

are evaluated against a comprehensive set of measures, ideally throughout all stages of the technology's life cycle. Such evaluation should be characterized by careful attention to socio-technical factors to maximize the likelihood of successful implementation and adoption.

E health and its implication in Indian context

Blaya J A et al in 2010, concluded that with the rapid growth of e-health in developing countries, there is clearly a crucial requirement for solid evidence of its impression to justify and guide the investment of resources in such systems. They also pointed out that despite major increases in assessments in recent years, most large e-health executions have little or no assessment data. *John et al in 2012*, concluded that although large programs for e-health implementation and research are being conducted in many low- and middle-income countries, more information on the impacts of e-health on outcomes and costs in these settings is still needed. *Praveen et al in 2013*, suggested that role of advance locally valid information on scaling up a strategy to overcome engrained discriminations in access to actual healthcare for under-served populations. Use of E health could be actual and cost-effective and shared with effective population-based strategies, have the potential to positively impact the healthcare of millions of Indians. *Sherwin et al in 2014*, concluded that the development and deployment of mHealth interventions in rural India should be encouraged, the interventions designed should be acceptable to the targeted population and minimally intrusive while ensuring the privacy of the end user. *Saberwal et al in 2014*, concluded that it's unlikely that E-Health will have widespread and sustainable impact without government involvement, especially in rural areas. *Majumdar et al in 2015*, stated that the increasing morbidity and mortality of NCDs in India, and the continuity of care required for them mandate the need for introduction of newer innovative technology. With the ever-growing user base of mobile phones in India, mHealth looks to be a viable option. Continued political commitment and support by the private stakeholders will be the key for advancement of mHealth research and services in India. *Acharya et al in 2017*, concluded that that telemedicine in healthcare could persuade be useful to patients in distant regions and to rural doctors in India. within the near future, telemedicine may be considered as an alternate to face to face patient care. *Bhatia et al in 2019*, stated that the E-Health services are an emerging solution to handle the problems of healthcare accessibility, affordability and financial viability in developing countries like India. They concluded that the key factors that require to be considered include age, location, computer literacy and healthcare status in terms of healthcare need, accessibility and satisfaction.

Discussion

Healthcare systems are one of the most intricate structural networks ever created. The fundamental challenge for E Health involves in revolutionizing the network processes and in creating new suitable framework embedded knowledge. The foremost priority now is to find innovative solutions that keep the social and economic costs of health care under control, while maintaining good clinical performances and acceptable levels of customer satisfaction. To do so, robust Electronic Health Record Systems, Patient

Relationship Management Systems and Telemedicine Systems with integrated socio-governmental-health distributed services incorporated in E health are the key.

E Health in India is mainly targeted at rural area unreached by modern medicine, and it is a challenge to run for profit programmes where most beneficiaries are poor. The E Health programmes face a variety of challenges, including the shortage of health care workers, especially in rural part of India, which affects the E Health proper implementation. The regulatory and policy framework is another challenge faced by in implementation of E health. In order to have clear policies and coordination between governmental agencies and E Health initiatives, appropriate government approach and intervention is required. The policies should aim at removing the disparity between information rich and information poor users, and to improve upon the standard of care. Teaching and adequate training the healthcare force in the area of E health is the need of hour. Appropriate incentivization is required to reduce the workforce drop out, and for the private players to steer the E health revolution in the country.

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