Evaluation of Literature on Role of Government Policies, Security, Organisation on

Electronic Health Record System

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Abstract

Health care sector in India has seen lot of improvement ever since after India gained Independence. Medical treatment, equipment, technology, Information system, rules and regulations and many others areas connected to healthcare have seen a lot of change. This paper makes an attempt to present the review of literature related to Health Information Systems(HIS). The key areas focused on literature are involvement of doctors and staff in HIS, infrastructure available and organization support during and post implementation of HIS. A few articles reviewed discuss on security measures taken to keep patient's data confidential, Government policies, strategies to have uniformity in EMR(Electronic Medical Record) leading to complete usage of EMR..

Keywords: Health Information Systems, Electronic Medical Record, Electronic Health records , Government policies, security.

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1.0 Introduction

According to the "Integrated Care EHR", as defined in ISO/DTR 20514, an "EMR is a repository of information regarding the health of a subject of care in computer-processable form that is able to be stored and transmitted securely, and is accessible by multiple authorized users". It has a commonly agreed logical information model which is independent of EHR systems and its chief purpose is the support of continuing, efficient and quality integrated health care and it contains information which is retrospective, concurrent and prospective. Inter-operability is helpful as the patient can go to any health care center and the doctor at that center can easily retrieve patients' information and give proper care. For this to happen there has to be uniformity in storing records and hence the Government has brought standards like SNOMED CT (Systemized Nomenclature of Medicine Clinical Terms)to handle clinical terminologies. For a health record of an individual to be clinically meaningful it needs to be from conception or birth, at the very least. Without standards, a lifelong medical record is simply not possible, as different records from different sources spread across ~80+ years potentially needs to be brought meaningfully together.

2.0 Objectives Of Study

The objective of the study is to review literature from across the world on Electronic Health Records with respect to role of Government policies, security and role of organization in implementing EHRs.

3.0 Research Methodology

The research is descriptive in nature. More than 200 literature on Electronic Health Records has been reviewed and then about 75 of them critically reviewed. Amongst these about 40 were found to specifically mention about the role of Government policies, security and role of organization in implementing EHRs.

4.0 Literature survey/review

There are various organization factors that influence the implementation of EHRs, this includes the doctors and staff involvement, the infrastructure and organization support during and post implementation. Otte-Trojel et.al (2015) in their study found that EHRs provides online access for patients which in turn led to patient satisfaction, patient-physician interaction improved and also it helped physician workflow and administrative tasks and deeper involvement of patients in medical decisions. Friedman et.al(2013) studies the challenges in using EHRs which were beyond legal and financial funding issues . They found that there was a need to improve the EHR data quality, expand data content and implement standards for the data and have wider population coverage. The clinicians spend significant time documenting patient care information in EHRs as it is required for the continuity of care. Aragon et.al (2014) found that diagnostic results and physician documents are viewed more often by nurses and ancillary caregivers. They found that organisations should provide ongoing education and awareness training for hospital clinical staff on available forms and best practices for effective and efficient documentation.

Blavin et.al(2013) projected that 65% of primary care physicians in large cities, 45% of primary care in small group practices and 44% of all other specialists could use EHRs meaningfuly by 2015 and the

projections were to 80%, 65% and 66% respectively in 2019.They found that in future , the results could provide insight into accuracy of expert opinion forecasts compared to traditional economic methods, and could help Government and industry set realistic expectations on how responsive physicians can be to future policy changes. After the shift from paper to electronic format of records there is a need to have real time availability of health records. Health Information Exchanges (HIEs) can be more effective for capturing, storing and sharing of patient information as it can help different practitioner to be able to treat the patient by looking into the past data. Since the data stored at different locations is in different formats of storage, it becomes difficult to combine them. (Hill et.al, 2015). The authors suggested use of Patient Access Number to be added to the insurance and also SSN. A PHR consists of patients' records of medical progress along with records from each of the previous healthcare providers(Kelly & Klodner, 2005, pg 114). Song, Paulo et.al(2011) in their study wanted to find the return on investment on the EHRs implementation. Although the initial investment on EHR is high, all organisations showed positive business case for its adoption. Very few of the "best practices" organisations could show evidence of return on investment. Many external factors also had influence on slow EHR adoption, like, economic policies. Some more findings on the non-financial costs and benefits would help health systems in resource allocation needed to support EHR adoption and implementation. Ginn, Gregory et.al(2011) in their study examined the relationship between the financial positioning and adoption of EHRs. They found that EHR adoption was more of a strategic decision than the financial decision. For smaller hospitals, the capital outlay was much higher than the returns whereas on the other hand , larger hospitals with large number of patients had better clinical outcomes by adopting EHRs. Each hospital makes a strategic decision and perceives that it will improve its fit with the environment.

Kazley et.al(2011) found in their study that there is inconsistency in EMR use and the performance. They conducted a survey and allowed respondents to indicate full or partial EMR(Electronic Medical Record) adoption and examined the internal consistency from one year to the next year. Health services research on information technology adoption is increasingly needed based on the intense focus on "meaningful use" by policy makers and practitioners. They suggested that organisations must be visited to study the status of EMR. Kersten , Sandra(2013) in her study found that EHRs had progressed from implementation to optimization and that provider organizations are beginning to realize the benefits of EHR technologies in their service delivery models. Information governance was found to be critical for maximizing the EHR and other information systems to get accurate and actionable data that can help organization to achieve improvements in care and costs. The study found that developing a program that engages clinical, legal, compliance, IT, finance etc will help in ensuring better health care management.

Zhivan et.al(2012) in their study empirically examined the association between hospital inefficiency and introduction of EHRs and computerized physician order entry(CPOE). The study found a positive association between them. The benefits of EMR adoption outweighed the costs of adoption of EMR for hospitals. A logistic regression showed that hospitals with greater degree of cost inefficiency were more likely to outweigh the costs of adoption. The results showed no association between cost inefficiency and CPOE adoption decision.

Nir Menachemi et.al(2011) identifies practice and physician related characteristics associated with the increased use of EHRs by physicians in outpatient practices. They found that physicians connected with multi-specialty practices, had higher levels of EHR adoption. The influence of

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practice location on EHR adoption level over time was found in the study. Younger physicians had higher adoption levels than older physicians. They also measured if years of experience influenced EHR adoption, with passage of time it helped practitioners to overcome cost and logistic barriers of adoption of EHRs.

Scott ,Philip et.al(2009) in their paper discussed about the implementation of Electronic Document Management(EDM) and the problems of historic record management. They found that the hospital staff should be trained and involved in implementation process for ease of usability. The trust strategy for interoperability remained and should be handled for integrating clinical information system. The study at that time found that balancing affordable levels of file preparation and acceptable level of clinical utility was a challenge. Hochron,Stuart et.al(2014)found that in spite of EHRs having tremendous benefits, there was a delay from physicians acceptance. Since the implementation requires huge investments, before embarking on such an initiative, finance leaders should conduct a targeted survey to access the likelihood that the initiative will meet physician resistance. The study provided a basis for an outreach program that will bring physicians on board and help them understand the initiatives purpose and giving them a stake in its success. Decker, Sandra et.al(2012) in their study found that only one-third of the physicians had systems with abilities to record information on patient demographics. They also found that non primary care and small practitioners and those aged above 55 did not adopt to the Health Record System even if the policies encouraged them to do so.

Darry Romanow et.al(2012) reviewed many journals, citations and found maximum work was done under Healthcare –IS. Healthcare environment has characteristics like (a)primary concerns (b)interoperability and (c) resistance to HIT. Maximum citation was to ensure continued growth in HIT body of knowledge and its importance in shaping IS theory as a whole. Research to lay groundwork for incorporation of genetic disposition with medical records holds a promise and high levels of privacy & ethical concerns for individuals. D'Amore et.al(2012) in their study found EHRs in U.S were isolating digital information in proprietary institutional databases. It was found that inadequate data exchange was a challenge to advancements in care quality and efficiency. Future will not see the advances of EHRs over paper documentation but instead will be whether the new digital infrastructure being effectively harnessed to break down barriers to quality improvement, effective information sharing and the reuse of medical data. Significant opportunities exist for research and public health personnel to prepare for this transition. Information is the lifeblood of modern medicine. Joanne Dorothy (2014) in his study collected information from people who were involved in moving health records from paper based system to an electronic health record system. Four major themes found were a) commitment to data quality (b) Managing a workforce in EHR environment (c) Gender and sexual bias experiences and (d) commitment to collaboration. This study would help practitioners who are implementing EHRs , other healthcare personnel who are implementing health record systems, human resource development, educators working with students in health information management programs. They found that the participants of the study were committed to quality, equality in pay and to collaborate with education system.

Karthikeyan & Sukanesh did a study on how health care can reach people who are really in need by using cloud services in India. Since , in developing countries , illiteracy is the major key root for deaths resulting from uncertain diseases, mentally affected, differently abled and unconscious patients cannot communicate about their medical history to medical practitioners. Hence the

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researchers discussed the use of palm vein pattern recognition based medical record retrieval system using cloud computing. Mala Rao & David Mant(2012) in their study on strengthening primary health care in India found that there were many opportunities for collaborative action of benefit for both nations, India and U.S. They found that it was expected that India will focus on health and recommend the strengthening of primary care as a key mean for delivering this goal. They found that India has the potential for affordable diagnostics and information technology in primary care to reduce health costs, empower its population to self manage their own illness and deliver care more effectively in remote areas. The National Health model of providing universal primary healthcare through public private partnership was appropriate with context to India.

Vishnoo Charan Reddy & alexander (2011) found in their study on healthcare Information Technology workforce changes and implications that the trend in IT staff hiring in hospitals was more expense per bed in small hospitals(with 100 beds or less) when compared to mid and large size hospitals. Menachemi(2011) in his study identifies practice and physician related characteristics associated with increased use of EHRs by physicians in outpatient practices. Factors associated with EHR adoption at any given point of time did not necessarily predict longitudinal increase in EHR adoption. Consistent with diffusion of innovation framework, the passage of time seemed to help medical practices overcome the cost & logistic barriers associated with EHR adoption.

Klein, Richard et.al(2007)conducted an empirical examination on patients' acceptance of internet – based patient-physician communication application. The results found the first time users intentions for further use of the utility. The providers had to take care of the security, integration and workload management. Ahmad Qasim(2014) found in his study that even though EHRs have potential to improve healthcare there has been slow adoption of this in few countries and on other hand countries like U.S, Australia, U.K, Malaysia and few others have adopted it well. There are many problems in this also like any other information technology. Ethical problems have to be taken into consideration while designing HIS. Patients have privacy concerns as to what would happen with their personal information that is gathered in the system. Hence procedures and policies to protect patients personal data are important.

Shank, Nancy et.al(2012) studied community behavioral health providers' beliefs about barriers and benefits of EHR. Their study covered quality of care, privacy and security and delivery of services. Most behavioral health providers had positive beliefs about sharing client records electronically. Their study showed that some of the barriers were privacy and security which were of high concern to behavioral health providers than to medical providers. Hence it was found that the ultimate challenge for success of EHRs is to ensure confidentiality of client records. Li, Ting et.al(2014) found that EHR provided lot of benefits to healthcare providers, but they found that to increase patients' likelihood to opt into EHRs, policy makers, healthcare providers and legal system should create conditions allowing patients to gain additional control over their personal information to obtain their consent before disclosing information. Also, if patients' right to limit disclosure could be acknowledged and to keep some information out of the record. Since interoperability had a negative effect technical architecture should be in a way to safeguard patient privacy.

Suhasini et.al(2012) in their study on benefits and challenges of ehealth found security in ehealth as one of the challenges. Ehealth is he transfer of health resources and health care by electronic means, enabled by communications technology through extensive information sharing and

collaboration . Since there is lot of sensitive information involved and the healthcare professionals are dependent on it, there are issues of integrity, confidentiality and security which needs to be addressed by the ehealth applications. These services provide improved quality of remote care and at a lower cost. Technology and service providers together with stakeholders of healthcare can develop universal standards for interoperability. Love, Varick(2011) in his analysis found confidentiality, integrity and availability as an important criteria for successful IT security strategy in U.S healthcare. Confidentiality is to prevent unauthorized disclosure of patients' EHR. Healthcare organisations must be diligent in understanding the risks being presented with not properly securing the patient records. Hence to create security strategy based on rules. These rules must be adhered to strictly as they are written and not simply as understood. If these are followed only then can it be assured that patient records will be protected and be truly secure.

Adoption of EHRs are at a rapid speed and hence its very important to consider patient's perceptions of their conflicting effects, like, improving quality care which introduces privacy and security risks.(Celeste Campos et.al, 2014). They found in their study that use of EHRs are related to non disclosure with respect to patients. To have maximum result from use of EHR it is important to have complete patient information which can be shared by providers. Non disclosure of patients' information cannot help in complete development. Hence, it has to be dealt by maintaining privacy and security between patient-provider to achieve the technology's potential.

Clarke, Irvina et.al(2009) in their study found that a growing number of organisations used technology to communicate medical information and store EHRs to best serve their patients and customers. They examined the use of EHRs , practices and methods to mitigate customer risks. They found the need to look into as to what information needs to be stored and for how long and if the patient moves to another location or provider should the hospital continue to maintain the records. Apart from all this, firewalls allowed physicians to access only the data which was required by them. Ethically one should use EHRs in the right manner and complete security and privacy of the information should be maintained.

Fatemah Rezaeibagha (2013) in his research on Electronic Patients Record regarding security and privacy by taking two case studies, Iran and Sweden to accomplish interviews and data collection. He found that co ordination of different security and privacy laws among different EPR systems was seen as a priority issue. It was seen that on one end as integrating and sharing EPR systems facilitated the collaboration of healthcare entities and brought benefits, on other end new threats such as loss of control from healthcare provider were also seen.

Mojed Adetayo(2016) in his study describes about EHRs in Sweden, the challenges faced by HER in health sector around the world and the newcomers and immigrants to Sweden know about the privacy, rights and policies that protect their privacy and data system. He found that it was a concern that the information is being exposed or disclosed by healthcare providers, and hence there was a need for confidentiality and security and privacy of EHR systems. There is a necessity for proper protection of patient data to move towards great working of EHRs. Sharma Kalpa(2012) in his study on usage of IT in healthcare sector in India found that the usage of IT applications in health care here was very less and to expand it several actions had to be taken. There was a need to formulate policies, standards or guidelines to maintain and control the quality. Government funding need to be improved in areas which can result in availability and improvement in current infrastructure,

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purchasing and installing technology, recruiting the competent staff or train existing health staff. Government should arrange training programs to enhance computer skills for health staff which can be done in partnership with private sector.

Richard Klein(2007) in his study on examining patient's acceptance of an Internet based application suggests that behavioral intentions shape se behaviors, perceived usefulness influences behavioral intensions and perceived ease of use impacts perceived usefulness. His analysis also reveals that patient trust beliefs in both provider and website vendor shape behavioral intentions with vendor reputation influencing user trust. Mouhamad Aldajani(2012) in his research on EPR security policy in Saudi Arabia National Health Services found that one of the key challenges during the adoption process is the security of EPR. The study comprised of literature reviews and interviews which established the current state of practice with respect EPRs in a representative Saudi Arabian hospital. He found that at that time Saudi Arabian EPR adoption process was proceeding without serious consideration for security policy to protect EPR and a lack of awareness amongst hospital staff.

Bashair Almutairi(2011) in his research investigates the desired benefits of EHRs in Kuwait health care centres and the barriers to its successful adoption. Research applied domain theory to identify the stakeholders and quantitative research design to focus on multiple case studies as a survey methodology. The results of first and second surveys were to develop a list of key EHR capabilities and adoption requirements. The third survey, for senior stakeholders at Kuwait Ministry of Health, to identify strategic roadmap priorities. Their priorities were found to be to improve quality of healthcare services, access to healthcare services and productivity of healthcare services. He identified the steps for roadmap to adopt EHR as establishments of national e-health Governance structure and mechanisms, establishment of the core foundations for electronic information exchange across the health sector.

Mohamud, Koshin(2015) in his study wanted to identify the core EHR functionalities available to physicians who work in public and private healthcare facilities and to the extent to which physicians are using the functions and also to understand the rate of adoption of EHRs in these hospitals and to identify the barriers to adoption of EHRs in public and private hospitals. Various functions available were Health Information and Data (29% vs 58%), Administrative Support(17% for public) , Reporting and population health(0% vs 28%), electronic communication & Connectivity(100% vs 100%). The large gap between two groups is in Result Management, Order Management & Decision Support functions. The researcher found private physicians had higher EHR adoption rate than public(25% vs 11%). The barriers for adopting EHR was found to be start-up costs(38% vs 47%)(private vs public). Outside stakeholders also play a role in adopting EHRs. Private physicians find little role of outside groups but public physicians indicate outside stakeholders have a role to play in decisions to adopt EHR for their practices. Access to internet was not a barrier. Financial considerations were also not a barrier.

5.0 Analysis of Literature

Literature showed that there was emphasis on involvement of doctors and staff in HIS, infrastructure available and organization support during and post implementation of HIS. Few articles reviewed discussed on the security measures taken to gain the patient's confidence, Government policies,

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strategies to have uniformity in EMR(Electronic Medical Record) leading to complete usage of EMR. Very few articles were found on comparison between use of EHR in public and private hospitals.

6.0 Conclusion

The study showed the importance of Government framing policies to implement the use of Electronic Health records. It also showed that maintaining standard codes for the medical terms would bring uniformity in records maintenance which would further help for interoperability leading to better care by doctors. These policies helps in getting good care at reduced costs. The review also brought out the importance of security of health records as this brings in confidence in the patients to maintain personal records electronically.

7.0 References

- Circular on Electronic Health Record by Ministry of Health and Family Welfare http://mohfw.nic.in/showfile.php?lid=1671
- https://www.nhp.gov.in/health-policies_pg
- http://www.karnataka.gov.in/hfw/kannada/Documents/Karnataka_Integrated_Public_Health_Policy_2017.PDF
- Electronic Health Record Standards for India , NHP,http://www.nhp.gov.in/ehr-standards
- Adetayo-odepidan, M. (2016). Electronic Health Record Systems : A study of privacy in the region Kronoberg of Sweden (Dissertation). Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-60198
- AlHamad, Ahmad Qasim; Al Omari, Faruq; AlHamad, Asma Qasim. (Apr 2014).Recommendation for Managing Patients' Privacy in an Integrated Health Information Network. *Journal of Information Technology and Economic Development, Beverly Hills* , *5*(1) , 47-52. Retrieved from https://search.proquest.com/openview/20384d71bb65bab63d258a3dd4eafe30
- Almutairi B. (2011).A strategic roadmap for achieving the potential benefits of electronic health record system in State of Kuwait. retrieved from http://discovery.ucl.ac.uk/1332883/1/1332883.pdf
- Aswath, Priya & Radhamani, Prajeesh. (2016). Barriers to Healthcare IT implementation. Retrieved from https://www.researchgate.net/publication/312470001
- Blavin, F. E., & Buntin, M. B. (2013). Forecasting the Use of Electronic Health Records: An Expert Opinion Approach. *Medicare & Medicaid Research Review*, *3*(2), mmrr.003.02.a02. http://doi.org/10.5600/mmrr.003.02.a02
- Celeste Campos-Castillo, Denise L Anthony. (April 2015). The double-edged sword of electronic health records: implications for patient disclosure. *Journal of the American Medical Informatics Association*, *22* (1),130–140. https://doi.org/10.1136/amiajnl-2014-002804
- Chakravarthi,Indira. (Dec 2013). Shift in processes of diffusion of medical technology in India and implications for public health. *Sodhganga@Inflibnet, Jawaharlal University* .Retrieved from http://ir.inflibnet.ac.in:8080/jspui/bitstream/10603/14369.
- Chisholm, Robin Lynn. (2014). Emergency physician documentation quality and cognitive load: Comparison of paper charts to electronic physician

documentation. ProQuest Dissertations Publishing, 2014. 3668008. Retrieved from https://search.proquest.com/openview/bfae2943af4ea6efe54b01410b87b197.

- Clarke, Irvine, III; Flaherty, Theresa B; Hollis, Stacy M; Tomallo, Mark . (2009).Consumer Privacy Issues Associated With The Use Of Electronic Health Records. *Academy of Health Care Management Journal; Arden* ,5(½), 63-77.

- D'Amore, J. D., Sittig, D. F., & Ness, R. B. (2012). How the Continuity of Care Document Can Advance Medical Research and Public Health. *American Journal of Public Health*, *102*(5), e1–e4. http://doi.org/10.2105/AJPH.2011.300640.

- Daniel J. Friedman, PhD, R. Gibson Parrish, MD, and David A. Ross, ScDDaniel J. Friedman, R. Gibson Parrish, and David A. Ross . (September 1, 2013) .Electronic Health Records and US Public Health: Current Realities and Future Promise. *American Journal of Public Health* ,103,(9), 1560-1567. DOI: 10.2105/AJPH.2013.301220

- Decker SL ,Jamoom EW, Sisk JE. (May 2012). Physicians in non primary care and small practices and those age 55 and older lag in adopting electronic health record systems. *Health Affairs,31*(5),1108-1114. doi: 10.1377/hlthaff.2011.1121.

- Freda Mold, Simon de Lusignan, Aziz Sheikh, Azeem Majeed, Jeremy C Wyatt and others.(March 2015). Patients' online access to their electronic health records and linked online services: a systematic review in primary care . *British Journal of General Practice,*4 (9), 141-151. Retrieved from http://bmjopen.bmj.com/content/4/9/e006021

- Ginn, Gregory O; Shen, Jay J; Moseley, Charles B.(Sept/Oct 2011). Hospital Financial Position and the Adoption of Electronic Health Records. *Journal of Healthcare Management , 56*(5), 337-352. Retrieved from http://journals.lww.com/jhmonline/Abstract/2011/09000/Hospital_Financial_Position_and_the_Adoption_of.7.aspx

- Hill, Dalvin; Du Fresne, Lionel J; Holder, Ian; Samudio, Ryan; Sujana, Nallavadla.(2015).Interconnectivity of health information exchanges using patient access number (PAN). *ASBBS E – Journal*, 11(1), 7-21. Retrieved from https://search.proquest.com/openview/e369cb6e63025c96af83d9321f871b3e/

- Hochron, Stuart; Goldberg, Paul. (Feb 2014). Overcoming Barriers to physician adoption of EHRs . *Healthcare Financial Management, 68*(2), 48-52. Retrieved from http://cdn2.hubspot.net/hub/356963/file-503932734-pdf/Practice_Unite-Overcoming_Barriers_to_Physician_Adoption_of_EHR-HFMA_Article.pdf https://doi.org/10.1186/2193-1801-3-63

- JeremiahScholl, ShabbirSyed-Abdul, Luai AwadAhmed. (Dec 2011). A case study of an EMR system at a large hospital in India: Challenges and strategies for successful adoption. *Journal of Biomedical Informatics,44*(6),958-967. https://doi.org/10.1016/j.jbi.2011.07.008

- Kalpa, Sharma. (2017). Health IT in Indian Healthcare System: A New Initiative. *Research Gate.* Retrieved from https://www.researchgate.net/publication/268005455.

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- Karthikeyan N, Sukanesh R. (Dec 2012). Cloud based emergency health care information service in India. *Journal of Medical Systems,* 36(6),4031-6. doi: 10.1007/s10916-012-9875-6.

- Kazley, A.S., Diana, M.L. & Menachemi, N. (2011). The agreement and internal consistency of national hospital EMR measures. *Health Care Management Science* , 14(4), 307-313. https://doi.org/10.1007/s10729-011-9165-8

- Kersten Sandra.(May/June 2013). Moving the needle toward data driven health care system: Optimizing the EHR through Information Governance . *Journal of Health care Compliance , 15*(3), 45-62.

- Klein, R. (2007). Internet-Based Patient-Physician Electronic Communication Applications: Patient Acceptance and Trust. *E-Service Journal, 5*(2), 27-52. doi:10.2979/esj.2007.5.2.27

- Love, Varick.(Nov/Dec 2011). IT Security Strategy: Is Your Health Care Organization Doing Everything It Can to Protect Patient Information?. *Journal of Healthcare Compliance,13* (6), 21-29.Retrieved from https://www.researchgate.net/profile/Varick_Love/publication/283721065

- Mala Rao, David Mant. (May 2012).Strengthening primary healthcare in India: white paper on opportunities for partnership. *BMJ 2012,344* . doi: https://doi.org/10.1136/bmj.e3151

- Menachemi, Nir ; Powers, Thomas L; Brooks, Robert G.(May/June 2011). Physician and Practice Characteristics Associated with Longitudinal Increases in Electronic Health Records Adoption. *Journal of Healthcare Management*, 56(3),183-198. Retrieved from http://journals.lww.com/jhmonline/Abstract/2011/05000/Physician_and_Practice_Characteristics_Associated.6.aspx

- Mohamud, Koshin.(2014). Electronic health records in Trinidad and Tobago. *ProQuest Dissertations Publishing,* 3739555. Retrieved from https://search.proquest.com/openview/9d4db00bb73f7cd51cbb4cb1f816cdff

- N Archer, U Fevrier-Thomas, C Lokker, K A McKibbon, S E Straus.(July 2011). Personal health records: a scoping review. *Journal of the American Medical Informatics Association*, 18(4, 1), 515–522. https://doi.org/10.1136/amiajnl-2011-000105

- Nancy Shank, Elizabeth Willborn, Lisa PytlikZillig, HarmoniJoie Noel.(April 2012). Electronic Health Records: Eliciting Behavioral Health Providers' Beliefs. Community *Mental Health Journal, 48*(2),249–254, Retrieved from https://link.springer.com/article/10.1007/s10597-011-9409-6

- Rezaeibagha, F. (2013). Privacy and Data Security of Electronic Patient Records (EPR) Sharing : Case studies: Iran and Sweden (Dissertation). Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:ltu:diva-56989

- Romanow, Darryl & Cho, Sunyoung & Straub, Detmar. (2012). Editor's comments: riding the wave: past trends and future directions for health IT research. *MIS Quarterly*,36(3),18. Retrieved from https://www.researchgate.net/publication/262253286

- Scott, P., & Williams, P. (2009). Deploying electronic document management to improve access to hospital medical records. *Journal of Management & Marketing in Healthcare*, *2*(2), 151-160. Retrieved from https://researchportal.port.ac.uk/portal/en/publications/deploying-electronic-document-management-to-improve-access-to-hospital-medical-records(c701b104-

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938b-4ca6-af01-15e3e9d3e94b).html Song, Paula H; McAlearney, Ann Scheck ; Robbins, Julie ; McCullough, Jeffrey S. (June 2011). Exploring the Business Case for Ambulatory Electronic Health Record System Adoption . *Journal of Healthcare Management, 56*(3),169-182. Retrieved from http://journals.lww.com/jhmonline/Abstract/2011/05000/Exploring_the_Business_Case_for_Ambulatory.5.aspx

- Suhasini Sabnis, Doug Charles. (Dec 2012). Opportunities and Challenges: Security in eHealth. *Bell Labs Technical Journal, 17*(3), 105-111. doi:10.1002/bltj.21561
- Terese Otte-Trojel, Thomas G. Rundall, Antoinette de Bont, Joris van de Klundert,(2015 Dec 16) and Mary E. Reed, The organizational dynamics enabling patient portal impacts upon organizational performance and patient health: a qualitative study of Kaiser Permanente. *BMC Health services Research , 15*,559, doi: 10.1186/s12913-015-1208-2
- Ting Li , Thomas Slee.(Aug 2014). The effects of information privacy concerns on digitizing personal health records. *Journal of the Association for Information Science & Technology, 65* (8),1541-1544**.** DOI: 10.1002/asi.23068
- Valerius, Joanne Dorothy. (2014). Experiences of health information managers with 20+ years of experiences in the complex and ever-changing healthcare environment. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/162695.
- Virginia Ilie, Craig Van Slyke, Mihir A. Parikh, James F. Courtney.(May 2009). Paper Versus Electronic Medical Records: The Effects of Access on Physicians' Decisions to Use Complex Information Technologies. *Journal of Decision Sciences Institute,40*(2), 213-241. DOI: 10.1111/j.1540-5915.2009.00227.x
- Zhivan, N.A. & Diana, M.L.(2012). U.S. hospital efficiency and adoption of health information technology. *Health Care Management Science, 15*(1), 37-47. https://doi.org/10.1007/s10729-011-9179-2

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