



Suggested Solutions to Obstacles Perceived In Implementations of Health Information Systems

Amandeep Kaur*
Research Scholar, CSE & PTU
India

Dr. Kulvinder Mann (CSE)
Dean T&P, GNE, Ludhiana
India

Abstract— *Despite the positive effects of Health Information Systems and Electronic Medical Records use in medical and healthcare practices, the adoption rate of such systems is still low and meets resistance from healthcare professionals. Obstacles appear when they approach systems implementation. We need to understand these factors in the context of Indian hospitals to enhance EMR adoption. This process should be treated as a change project. Objectives of this research are to identify, categorize, and analyze obstacles perceived by different healthcare professionals to the adoption of EMRs in order to provide suggestions on beneficial actions and options. The study identified six main categories of obstacles, which are consistent with those reported in recent published research. 1) Human Obstacles, related to the beliefs, behaviors and attitudes, 2) Professional Obstacles, related to the nature of healthcare jobs, 3) Technical Obstacles, related to computers and IT, 4) Organizational Obstacles, related to the hospital management, 5) Financial Obstacles, related to money and funding and 6) Legal and Regulatory Obstacles, related to laws, regulations and legislations. The six categories of obstacles were validated with the participants of the pilot sample. Human obstacles as well as financial obstacles are the two major categories of obstacles and challenges in the way of successful implementation of EMRs.*

Keywords— *Obstacles, HIS, medical records, EMR, suggested solutions.*

I. INTRODUCTION

The importance of this research comes from its aim to focus on the necessity of implementation of health information systems and electronic medical records in hospitals, and to shed more light on the main obstacles on implementation of health information systems and electronic medical records in an effective and efficient way and on a large scale, which would enable health care professionals and providers to make better use of health information systems and electronic medical records available in many hospitals and subsequently provide better health care.

The research aimed also to analyse the perceived obstacles from the perspectives of health care professionals through their knowledge and experience about factors that might - from their point of view - lead to the experienced delay or failure of adopting and implementing health information systems and electronic medical records at their hospitals where they work. This analysis should put our hands on the point that we should start from, to improve and accelerate the process of adopting and implementing health information systems and electronic medical records in hospitals of developing countries. The most prevalent obstacles that delayed or hindered the adoption and successful implementation of health information systems and electronic medical records - according to many local healthcare professionals - were the human obstacles, including negative beliefs, behaviours and attitudes of healthcare professionals towards such systems. [1]

The great resistance of physicians and other healthcare professionals to accept and use health information systems and electronic medical records is probably one of the major obstacles that delayed the adoption and successful implementation of such systems. This is why the process of HIS and EMRs implementation should be treated as a change project, and led by change managers, in medical practices. The quality of change management actually plays an important role in the success of implementation. [2].

Actually the analysis of the human obstacles of adopting and successfully implementing health information systems and electronic medical records could reveal a lot of factors related directly to the beliefs, attitudes and behaviors of healthcare professionals such as the ability to learn over time, computer knowledge and typing proficiency, understanding and believing in HIS and EMR systems, motivation and personal initiative to explore and use the systems and user-developed strategies and workarounds to solve minor difficulties. [3]

II. THE RESEARCH PROBLEMS

Despite the great concern and obvious interest in adopting and implementing health information systems and electronic medical records in general in both developed and developing countries, we find - especially in developing countries - that there is a large gap between planning for the introduction of health information systems and electronic medical records to hospitals and the success of implementing such systems and operating them optimally to achieve the primary purpose and benefit desired and expected.

The real obstacles behind this gap may not be the technology available to the medical institutions or to those developing countries, as information technology and information systems actually are becoming available almost equally to all world countries, no country or region in the world has no computers or information networks, while the real obstacles may be in the problem of deficiency in providing technical support for those systems during and after their implementation, as well as the cost of changing the traditional paper medical records to the electronic system as well as the insufficient health care financing - in some cases - to cover the costs of implementing health information systems, operating them and the costs of training the end user on how to manage such systems. [8]

In many developing countries, we find that the available technology and costs of such advanced information technology systems in addition to the lack of technical expertise, technical and computer skills of hospital staff hospitals, largely the computer skills of doctors and members of the nursing staff and technicians, and the lack of facilities for data processing are the key issues to be addressed prior to implementation of hospital information systems. [9] [10]. We can add to all these factors - as mentioned above - the resistance shown by many doctors and health care professionals generally when systems change from the traditional paper medical records to the electronic medical records. This problem may be common in both developed and developing countries alike. [11] Most health care administrators and health information managers are aware that this change - from paper based systems to electronic systems - may take some time to be done and time is also needed to modify the behaviors of doctors and health care practitioners and their perception of electronic clinical systems and change their attitudes, their impressions and beliefs about the change of the work environment from the old paper to the new electronic nature with the essential need to understand the real reason and purpose behind the desire to change to the electronic system which is the most important thing in the whole subject. [12]

III. AIMS AND OBJECTIVES OF THE RESEARCH

The research aims to identify the most important obstacles and constraints that hinder the successful implementation of health information systems and electronic medical records. It also aims to shed more light on the relative importance of these obstacles and their nature and quality and their linkages and relationships to the various components and elements of the health information systems. Specifically it examined the impressions, beliefs, behaviors and attitudes of working medical staff towards those systems, or the linkage of these obstacles to the policies of hospital management and their different business priorities, the linkage of these obstacles to the available information technology, networks, hardware and software, the linkage of these obstacles to the provision of the appropriate funding sufficient to cover the costs of implementing and operating health information systems and training and costs of developing the skills, knowledge and experiences of health care workers.

IV. RESEARCH CONCLUSIONS

Participants believed that the human obstacles, those related to the healthcare professionals and their beliefs, plus the financial obstacles, related to money and funding are the two major obstacles and challenges in the way of successful implementation of EMRs and human factors are even more important. All participants agreed and sometimes strongly agreed on the benefits expected after the implementation and use of EMRs, most importantly the potential of the EMRs to improve information access, increase productivity, improve efficiency and accuracy of coding and billing, clinical management and quality of healthcare in general, in addition to reducing costs of healthcare and medical errors. Government hospitals had much more complains and concerns than private hospitals, especially when it comes to the technical and organizational factors, where systems are old and not satisfying the increased needs and in the same time the hospital doesn't have the experience to go with EMRs implementation.

V. IDENTIFIED OBSTACLES AND SUGGESTED SOLUTIONS

A. OVERCOMING HUMAN OBSTACLES

There is lack of awareness of the importance and benefits of using EMR which can be improved by making this topic as integral part in medical courses in medical colleges and formal training should be provided. Short courses for healthcare professionals and continuous medical education programs should be provided on the subjects of EMRs and health information management. These programs should be provided on the subjects of EMRs. We also need to teach computer science courses in medical schools.

Another way to overcome human obstacles is by increasing the numbers of health informatics technicians and specialists through developing both undergraduate as well as post graduate specialized programs in "Health Informatics", "Health Information Management" and "Health Information Technology". This way we could establish a new generation of professionals specialized in this new discipline. Undergraduate programs would deliver health information technicians and basic level professionals, while post graduate programs would deliver leaders, consultants and specialists in the field.

The negative beliefs about EMR can be overcome by developing an in-house hospital orientation and training programs on EMRs - especially for newly appointed staff.

B. OVERCOMING FINANCIAL OBSTACLES

Implementation as well as maintenance cost of EMRs needs high funds so proper funds should be allocated especially at the start of EMR projects so designing the annual budgets of the hospitals is must to capacitate the high operation and

maintenance costs of EMRs, which should be a part of the regular expenses of operations and not a burden on the hospital resources, by being unscheduled or unplanned. There should be proper planning of hospital resources in the phases of EMRs implementation because if the resources are not well planned, they might get overused during implementation projects

C. OVERCOMING LEGAL AND REGULATORY OBSTACLES

There is lack of policies/ procedures that govern EMRs on hospital level and also lack of laws or legislation that govern EMRs on national level. Electronic health information is easily accessed/disclosed. So Ministry of health should start developing rules and regulations - on the national level - for the use of EMRs. In parallel with that, hospitals should start developing their own policies and procedures that control the use of data, information and EMRs internally, including signing privacy and confidentiality agreements and consents.

Using EMRs may threaten confidentiality of health information. And it may lead to information loss, corruption and hacking so Users should be educated, trained and committed on using EMRs with caution not to disclose or abuse the information otherwise they will put themselves into liability, accountability and legal problems.

D. OVERCOMING ORGANIZATIONAL OBSTACLES

Sometimes it is important for hospitals to redesign their medical and administrative workflow to match with EMRs specifications. This adaptation is important for the successful implementation. Implementation of EMRs should be controlled by a time frame and project management schedules not to let the EMRs implementation take more than expected time. Hospital management doesn't have the necessary experience to choose & implement the best EMRs. Hospital management doesn't have the necessary experience to evaluate the performance. Hospital management should develop their experience choose, implement and evaluate EMRs and their performance over time. If hospital management cannot get that experience, they should be advised to recruit an expert to the hospital team or simply outsource the process of EMRs selection and evaluations. Hospitals should check for an installed live model of the system in another hospital so as to evaluate the system while in the production phase. Hospital management should develop a strategic plan for the adoption, implementation and future development of EMRs. Hospital management should provide necessary initial and continuous training for hospital staff on how to best use EMRs and HIS.

E. OVERCOMING TECHNICAL OBSTACLES

There are no manuals or guidelines for using EMRs and computers and networks have a lot of maintenance problems. There is no maintenance/technical support for hardware/software. It should be ensured that HIS and EMRs vendors and commercial providers are supplying hospitals with the proper system documentations, user manuals and guidelines for using and troubleshooting EMRs. We have to make sure that computers and networks are working fine -in terms of hardware - and that they have less maintenance problems, so that we can guarantee that the software will consequently work better. Hardware maintenance and technical support is essential. We might need to upgrade computer machines and communication networks for new ones, update their operating systems to enhance their performance. Technically, EMRs should be satisfying different users' needs, this can be achieved - as we mentioned above - by performing requirements analysis thoroughly before the design phase is started and much before the implementation phase starts. Data entry difficulties should be overcome through implementing new innovations in both software and hardware. For the software innovations, the system should be designed to support structured data entry rather than unstructured, drop down list fields more than text fields, dictation and voice recognition techniques. For the hardware innovations, we can implement touch screens, hand-held devices and tablet PCs so as to minimize the gap between the acquisition of data and the process of recording them and provide every user with a computer device so as to make information accessibility easier.

F. OVERCOMING PROFESSIONAL OBSTACLES

There is lack of healthcare professionals' support to EMRs and motivation to learn and train on using EMRs. It can be overcome by improving healthcare professionals' support to EMRs through increasing their participation and involvement in the stages of systems development, systems implementation and deployment. Healthcare professionals support would be much better if developers and implementers of EMRs took into account their different needs during the stages of requirements analysis and before implementation. And by improving motivation of healthcare professionals to learn and train on using EMRs by providing them with direct and indirect incentives, including overtime payments, bonuses and rewards for the hospital sections and departments successfully implementing EMRs. Departments that achieved well should also be recognized. We should also provide the enough time suitable and convenient for healthcare professionals to learn and train on using EMRs. Training programs should be conducted for healthcare professionals to educate them on how to take new EMRs responsibilities and accountabilities, so they would better understand their part of the process.

VI. CONCLUSIONS

The study identified six main categories of obstacles in the implementation of health information system; Human Obstacles, related to the beliefs, behaviors and attitudes, Professional Obstacles, related to the nature of healthcare jobs, Technical Obstacles, related to computers and IT, Organizational Obstacles, related to the hospital management, Financial Obstacles, related to money and funding and Legal and Regulatory Obstacles, related to laws, regulations and legislations. The six categories of obstacles were validated with the participants of the pilot sample. Human obstacles

as well as financial obstacles are the two major categories of obstacles and challenges in the way of successful implementation of EMRs. These obstacles can be overcome by improving information access, increasing productivity, improving efficiency and accuracy of coding and billing, clinical management and quality of healthcare. We should work on these obstacles in two phases according to the following order: in the first phase, we should work on the human obstacles, related to the healthcare professionals' knowledge, beliefs and attitudes and also on the financial obstacles related to money and funding of EMRs projects. In the second phase we should work on the legal and regulatory obstacles, related to laws and policies, then on organizational obstacles, related to the hospital management support, then on technical obstacles related to information technology, computer hardware and software used, then on professional obstacles related to the nature of medical staff members working in hospitals.

REFERENCES

- [1] Altuwajiri M., Bahanshal A., Almehaid M. Implementation of computerized physician order entry in National Guard hospitals: Assessment of critical success factors. *J Fam Community Med* 2011;18:143-
- [2] Boonstra, A., & Broekhuis, M. (2010). Obstacles to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC Health Services Research*, 10(1), 231. BioMed Central.
- [3] Holden, R. (2011). What Stands in the Way of Technology-Mediated Patient Safety Improvements? A Study of Facilitators and Obstacles to Physicians' Use of Electronic Health Records. *Journal of Patient Safety*. 2011 Dec;7 (4):193-203.
- [4] Sapirie, S. (2000). Assessing Health Information Systems. Design and Implementation of Health Information Systems. World Health Organization.
- [5] Siddiqi, A., Ahmed, Y. M., Alginahi, M., Alharby, A. (2009). Use of information and mobile computing technologies in healthcare facilities of Saudi Arabia. *International Conference on Information and Communication Technologies*. IEEE.
- [6] Almalki, M., Fitzgerald, G., & Clark, M. (2011). Health care system in Saudi Arabia: an overview. *Eastern Mediterranean Health Journal*, 17(10).
- [7] Bah, S., Alharthi, H., El-Mahalli, A., Jabali, A., Al-Qahtani, M., and Al-Qahtani, N., "Annual Survey on the Level and Extent of Usage of Electronic Health Records in Government-related Hospitals in Eastern Province, Saudi Arabia." *Perspectives in Health Information Management (Fall 2011)*: 1-18.
- [8] Amatayakul, M. (2010). Keys to successful EHR implementation. *Healthcare financial management journal of the Healthcare Financial Management Association*, 64 (12), 104, 106.
- [9] Al-Shorbaji, N. (2008). E-health in the Eastern Mediterranean Region: a decade of challenges and achievements. *Eastern Mediterranean health journal La revue de sante de la Mediterranee orientale alMajallah alsihiyah lisharq almutawassit*, 14 Suppl, S157-S173. World Health Organization, Regional Office for the Eastern Mediterranean.
- [10] Haughom, J., Kriz, S., McMillan, D. R. (2011). Overcoming obstacles to EHR adoption. *Healthcare financial management journal of the Healthcare Financial Management Association*, 65(7), 96-100.
- [11] Borycki, E., Joe, R. S., & Armstrong, B. (2011). Educating Health Professionals about the Electronic Health Record (EHR): Removing the Obstacles to Adoption. *Knowledge Management*, 3(1), 51-S. M. Metev and V. P. Veiko, *Laser Assisted Microtechnology*, 2nd ed., R. M. Osgood, Jr., Ed. Berlin, Germany: Springer-Verlag, 1998.