

# Electronic Health Records, its Necessity in Health care and Competencies Required by Nurses

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**Abstract**—Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. As the patients become well informed and aware about healthcare, the current situation necessitates healthcare professionals to be more systematic and organized to provide quality patient care. The objective of this paper is to highlight the benefits of EHR system, its significance in health care and competency skills required by nurses to adopt the technology efficiently. As nurses take the lead in clinical setting, the paper would highlight the role of nurses in various aspects of EHR adoption and implementation. It would also describe with examples, the competency skills essential for nurses to be able to adopt EHR successfully.

## 1. INTRODUCTION

The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting.

There is a variety of information that can be stored, tracked and generated using EHR such as patient demographics, vital signs, medical history, lab data, radiology reports, medications, nursing care plan and documentation

The EHR has the ability to generate a complete record of a clinical patient encounter as well as supporting other care related activities directly or indirectly via interface including evidence based decision support, quality management, and outcomes reporting [1]. The benefits of EHR continue to evolve with rapid maturation of information technology.

## 2. REVIEW OF LITERATURE

It has been demonstrated through various researches that EHR is going to change the future of health care and the nurses will play a big role in implementation process. But it is evident that EHR designs even as of today are not very well oriented to the requirements of healthcare professionals.

Stevenson, JE, Nilsson GC (2012) conducted a study with the aim to explore nurses' perceptions of using an electronic patient record. Nurses reported that the electronic patient record did not support nursing practice when

documenting crucial patient information, such as vital signs. The study concluded that efforts need to be put in to include views of nurses when designing an electronic patient record in order to ensure that it suits the needs of nursing practice and supports patient safety. Essential patient information needs to be easily accessible and give support for decision making [2].

Lu CH, Hsiao JL, Chen RF (2012) conducted a study to explore factors influencing the acceptance of hospital information systems by nurses. The results indicated that system quality, information quality, and service quality were positively correlated with the perceived ease of use ( $R=0.69$ ) and perceived usefulness ( $R=0.72$ ). Information quality has the greatest influence on perceived usefulness ( $\gamma_3=0.57$ ,  $P<.001$ ) and ease of use ( $\gamma_4=0.61$ ,  $P<.001$ ). Perceived usefulness has a significant influence on system acceptance ( $R=0.75$ ). Perceived usefulness ( $\beta_1=0.61$ ,  $P<.001$ ) has a significant influence on system acceptance. The results of this study provide a valuable reference for hospital administrators in developing hospital information systems [3].

Stevenson JE, Nilsson GC, Petersson GI, Johansson PE (2010) concluded that Electronic Patient Record (EPR) systems have a huge impact on nursing documentation. Although the largest group of end-users of EPRs, nurses, have had minimal input in their design. Results showed that nurses experienced widespread dissatisfaction with systems. Current systems are not designed to meet the needs of clinical practice as they are not user-friendly, resulting in a potentially negative impact on individualized care and patient safety. There is a need for nurses to be directly involved in software designing in order to ensure that the essence and complexity of nursing is not lost in the system [4].

Sequist TD, Cullen T, Hays H, Taulii M M, Simon SR, Bates DW (2006) evaluated the implementation of an EHR within the Indian Health Service (IHS). The survey instrument assessed clinician attitudes regarding EHR implementation, current utilization of individual EHR functions, and attitudes regarding the use of information technology to improve quality of care in underserved settings. 66% of clinicians felt that the EHR implementation process

was positive. One-third (35%) believed that the EHR improved overall quality of care, with many (39%) feeling that it decreased the quality of the patient–doctor interaction. One-third of clinicians (34%) reported consistent use of electronic reminders, and self-reported that HER's improved quality was strongly associated with increased utilization of the EHR (odds ratio 3.03, 95% confidence interval 1.05–8.8). Clinicians supported the use of information technology to improve quality, but many felt that it was not currently fulfilling its potential in the IHS, potentially due to limited use of key functions within the EHR [5].

In a study conducted by **Kossman SP, Scheidenhelm SL (2006)** which addressed community hospital nurses' use of electronic health records. Nurses reported that the use of electronic health records enhanced nursing work through increased information access, improved organization and efficiency, and helpful alert screens. They thought that the use of the records hindered nursing work through impaired critical thinking, decreased interdisciplinary communication, and a high demand on work time (73% reported spending at least half their shift using the records). Administrative implications were involving bedside nurses in system choice, streamlining processes, developing guidelines for consistent documentation quality and location, increasing system speed, choosing hardware that encouraged bedside use, and improving system information technology support [6]

### 3. INTEROPERABILITY AND STANDARDS

Standardization of EHR is required to universally understand and implement system effectively. The need and demand of EHR may slightly vary. Vendors have been implementing some standards, but have had a great deal of variation in their implementation methods, which results in systems that cannot interoperate [7]. Electronic patient records today are highly idiosyncratic, vendor-specific realizations of patient record subsets. They adopt few, if any, health information standards, and very rarely accommodate controlled terminologies where they might be sensible, as stated by **Stevenson JE, Nilsson GC (2012)** where the nurses reported that the electronic patient record did not support nursing practice when documenting crucial patient information, such as vital signs. The study emphasized the need to include nurses in system designing to ensure that it suited the needs of nursing practice [2]. The reason of this incompatible data has more to do with the limitations of available information standards and vocabularies than with any fundamental unwillingness to adopt standards. Studies have been conducted and have led to the realization of need for standardized language universally. **Bakken S, Cimino JJ, Haskell R, Kukafka R, Matsumoto C, Chan GK, Huff SM (2000)** tested the adequacy of the clinical LONIC (Logical Observation Identifies, Names and Codes) as a terminology model for standardized assessment measure. The results supported adequacy of the clinical LOINC semantic structure as a terminology model for standardized assessment. This was a step to standardize the

assessment items in a manner that facilitated data sharing and re-use [8]. In 2013, Ministry of Health & Family Welfare (MoH&FW) proposed the Electronic Health Record (EHR) Standards for India. It has been revised in the year 2016. The emphasis on interoperability and standardization has been emphasized with proposed standards that may be utilized for efficient adoption of EHR systems [9].

### 4. WORKFLOW IMPLICATIONS

**Physicians, Nurses, and Other Professionals-** EHR system involves participation of everyone who plays an active role in patient care. It involves a constant participation on the part of the physician, nurses, lab professionals and administrative staff. The responsibility does vary from set up and type of information being entered in the system. Physician may have to spend less time updating static data, such as demographic and prior health history, because these data are populated in the record. They have access to other automated information and important decision support systems. Alerts are a significant capacity of EHRs because they identify medication allergies and other needed reminders. For clinical researchers, alerts can be established to assist with recruitment efforts by identifying eligible research participants. **Carroll SS, Edwards JN, Rodin D. (2012)** in a study among nine hospitals concluded that for successful implementation of EHR system involvement of all level of staff in selection, development and peer education is absolutely essential. It also requires strong executive, clinical support and leadership [10].

As highlighted by many studies, nurses are the largest group of health professionals who utilize health care technology wherever EHR was implemented thus engaging nurses in designing the system and training them becomes important. As suggested by **Cox RA (2005)** that individual, technical, and organizational factors seemed to influence the adoption process of EHR system in any health care setting. Technical factors included the nurse's computer skill level, their use of the pre-existing computer system, and the availability of the EHR program [11]. It has been estimated that EHR will influence the quality of care provided by the nursing professionals by updating nursing procedures and adding decision support tools. As supported by a study conducted by **Mclane S (2005)** who concluded that data collected from an EHR system contains rich, accurate documentation of nursing interventions and documentation of the importance about the care provided by nurses [12].

### 5. CHALLENGES IN IMPLEMENTATION OF EHR SYSTEM IN INDIA

Following are some of the challenges that professionals may encounter.

- The lack of awareness about the benefits of EHR is the largest perceived barrier.

- Stakeholders operating within a hospital are defiant in adapting to the EHR.
- The high cost of implementation increases capital requirement.
- The implementation process of time that negatively influences the ongoing workflow in any hospital. The vendors implement the various modules of EHR in phases. This implementation process affects the ongoing workflow in the hospital.
- Lack of user-friendly interface adoption.
- The vendors lack domain knowledge in healthcare. This results in development of EHR with various gaps. Technology being the primary competence of the vendors, they tend to develop products that highly are incompetent. The gap existing between the information technology and healthcare needs to be bridged by vendors to develop effective EHR products [13].

## 6. BENEFITS OF ELECTRONIC HEALTH RECORDS

It has already understood and accepted by the health care industry that EHR has many benefits over the records that are maintained on papers:

- Helps tracking of the patient through patient's unique ID number.
- Helps in monitoring various patients' parameter like BP, important alerts etc.
- Contributes to overall quality improvement of care being provided to the patient.
- Providing **accurate, up-to-date, and complete information about patients** at the point of care
- Enabling quick access to patient records for more **coordinated, efficient care**
- Securely **shares electronic information** with patients and other clinicians
- Helps providers to more effectively **diagnose patients, reduce medical errors, and provide safer care**
- Improving patient and provider interaction and communication, as well as **health care convenience**
- Enable safer, **more reliable prescribing**
- Helps promote **legible, complete documentation** and accurate, streamlined coding and billing
- Enhancing privacy and security of patient data
- Helps providers **improve productivity and work-life balance**

- Reduces costs through decreased paperwork, improved safety, reduced duplication of testing, and improved health [14].

## 7. SIGNIFICANCE OF EHR IN HEALTH CARE AND ROLE OF NURSE IN INDIAN SETTING

Many hospitals in public and private health care settings are already using EHR systems including the very basic demographic profile, medical history, medication and allergies, diagnostic test results like radiology, lab test, financial details etc. Nurses being the key link in patient care connecting many professionals have a very important role in successful implementation of EHR systems. As suggested by **Alliance of Nursing Informatics** nurses should contribute in effective designing and use of EHR systems to impact the quality and efficiency of healthcare services [15]. As documentation has been emphasized a lot in nursing especially with various quality initiatives in action, the perception about the concept of EHR seems to be that it will add more to nursing workload unless the healthcare goes completely paperless. It has been evident from studies conducted in many setting that nurses understand that the EHR enhances nursing work by increasing access to information but also help in quality control, still it requires guidelines for consistent documentation, quality management, more efficient software and systems availability [16].

There is a need that the nurses understand the system and also become competent enough to maintain effective system management and smooth functioning on EHR systems.

## 8. COMPETENCY SKILLS OF NURSES

With the growing use of information technology, the nurses need to go beyond the basic computer skills to keep up with the pace. Technology Informatics Guiding Education Reform (TIGER) project has proposed a series of competency related to EHR under information management competencies. [17]

Nurses are actively involved in using EHR system for their daily tasks. Areas where nurses are responsible are as follows.

- Patient Acuity Classification Systems
- Nursing Personnel Management Systems
- Nursing Care Planning System
- Quality Assurance Systems
- Patient Census Systems
- Inventory Systems
- Order Entry and Results Reporting Systems
- Discharge Planning Systems

- Managed-Care System- Critical paths and interdisciplinary communication

Competency assessment of Indian nurses about EHR system remains in early stages as of now and individualized to the public and private sector where EHR is implemented. The assessment of nurses is done by the seniors or the educators, and the evaluation process is not yet standardized.

The majority of the knowledge and skills are acquired as nurses are exposed to it as a part of on the job training. No standardized competency tools are yet available in India to assess whether the nurse is competent enough to work with EHR system.

## 9. CURRENT SCENARIO IN INDIAN SETTING

India initiated the concept with medical informatics officially with the conception of a professional society named Indian Association of Medical Informatics. It is aiming at making Medical Informatics as one of the elective subjects in the UG curriculum for all medical colleges in India and to get academic credits from the Medical Council of India [18].

National Informatics Centre (NIC) was another big initiative in IT and is a prime builder of e-Governance applications up to the grassroots level [19].

Another important step in Health IT was the conception of e-health care foundation which is a web based patient care system that tracks a patient's health record from the time of their joining the network. This model has been extended to help manage small civil and community hospitals across their various functions. Health Cards are issued to any villager who wants them for a nominal fee. The system has been used to generate tele-health capabilities as well. Online Medical Advice is arranged for the rural patients so they need not travel to far off places [20].

Many hospitals across the country have electronic health records, they are utilizing telemedicine and the concept of e-ICU has already touched small towns in collaboration with tertiary care hospitals [21]. **Budhiraj S, Mishra N, Chhabra D, Sittig DF, Singh H, Pahuja N(2012)** measured the progress of EHR implementation among four facilities of healthcare system, India found that nurses were responsible for maximum use of the EHR system. It was concluded that though this is the transitional phase, most of the users were comfortable using the system after few days of practice and could understand the advantages of EHR in providing quality patient care [22].

## 10. CONCLUSION

Nurses are not so comfortable using EHR system but they do understand the importance of EHR system as suggested by **Choi J(2012)** who assessed the competency of nursing students at various undergraduate levels which disclosed that students lacked "Applied computer skills" and "Clinical

informatics role" [23]. The burden of the current problem shifts towards the administrators and nursing leaders to ensure rigorous training and hands-on practice on EHR system for nurses. There is an urgent need to understand the importance of training the nursing professionals through focused clinical training sessions/ in-service sessions. The future demands standardized competency-based tools to enhance the accountability of nursing professionals as well as prepare the nursing students for practice.

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