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Electronic Health Documentation and Its Impact on Nurses Routine Practices

Literature Review

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Abstract

Electronic Health Documentation – Impact on Nurses Routine Practices

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The Electronic Health Record (EHR) has had the potential to revolutionize medical documentation and patient management. EHR has been widely used to simply collect the patient health information; it has improved the problem by making the personal health record accessible anytime via a computer. Public and private sectors are actively using electronic health record to access patient data, which has enabled the communication of volumes of clinical information accessible and easier to retrieve.

The purpose of this study was to investigate how electronic health records affects nurses work practices in their daily routine. This Master's thesis was based on various literature evaluation carried out by experts to measure the time variation between health information exchange and paper based records

On the basis of the results of this study, it was evident that nurses play an essential role in the acquisition, evaluation and application of the electronic health records. The study showed that EHR improve the quality of care, performance, and time efficiency and reduces costs.

Keywords, Electronic Health Records, Paper records, Time efficiency, Work routine.

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1 Introduction

The electronic health record is progressively being used within health care institutions to enhance the quality and safety of patients care, it is essential requirements that health care providers promote in the health care institution. However, there are challenges associated with EHR. These challenges prompted EHR systems inventions to boost efficiencies, and these systems have come with benefits. In healthcare organizations, physicians and nurses are the main service providers who benefit directly or indirectly from EHR systems apart from the patients. Health experts have acknowledged that the ability of nurses and physicians to utilize EHR effectively is significant to patients' wellbeing, reduced costs for training and decreased healthcare expenditures, However, nurses require skills and knowledge to use EHR effectively; they gain the knowledge through training and on job coaching (Powell-Cope, Nelson & Patterson 2008, 50).

The importance of EHR in health sectors has led to health agencies and bureaus emphasizing its implementation to boost patients' safety. In the United States, the Institute of Medicine (IOM) brought the world's awareness to the patient protection vulnerabilities of health care programs. It also highlighted the need for extensive adoption of EHRs as a fundamental constituent of a novel health information technology (HIT) framework designed to enhance health care quality (Campbell, Hong, Mori, Osterweil & Guise 2011, 1).

The concept of Electronic Health Record has been formulated to integrate multiple physician-generated electronic medical records and the patient-generated personal health record. The EHR is intended to facilitate optimal management of the health of individual or when used in aggregate of a population. EHR has also been established to link across care settings and facilitate collaborative, coordinated approached among caregivers and enhance the tracking and monitoring of the quality of patients care activities (Ambinder 2005, 57).

The Electronic Health Record has had the potential to revolutionize medical documentation and patient management. It is has been widely used to simply collect the patient health information, it

has remedy the problem by making the personal health record accessible anytime via computer. Public and private sectors especially in Europe are actively using electronic health record to access patient data, which has enabled the communication of high volumes of clinical information accessible and easier to retrieve (Persell, Kaiser, Andrews, Khandekar, Thompson, Friesema & Baker 2011, 117).

Health professionals have argued that a limited study have been implemented on the impact of HIT, like EHRs, on patient safety and care. According to Lorenzi, Kouroublai, Detmer and Bloomrosen (2009, 15) visionaries have anticipated that widespread availability of EHRs in ambulatory care settings can improve the quality of care and improve communication with patients, reduce transcription costs, provide clinicians with easier cross coverage, and support decision-making by clinicians and patients. However, the EHRs offer healthcare organizations with instruments, such as alarms and reminders, to help to automate procedures for enhanced clinical accuracy and results. The benefits of EHRs to patients are obvious; however, the impacts of electronic health documentation to nurses' routine practices have a gap for further studies. Based on the gap analysis, the research question under discussion is: *"in what ways do Electronic Health Record impact nurse´s work practice efficiency?"*

2 The Background of the Thesis

Nurses play an essential role in the acquisition, evaluation and application of the electronic health records. The EHRs allow both the nurses and physicians to have easy access to patient health data and information to make timely clinical decision. Moreover, this information can be accessed when and where they are needed.

The use of EHR system enhances health care time efficiencies; however, more pieces of research need to be carried out to examine the benefits of the EHR and its impact on physicians, nurses and patient. Most studies of EHR evaluation are based on safety, quality, integration and improvement, and less on the impact to physicians and nurses. While both physicians and nurses notice the added

value of incorporating EHR into their daily activities, nurses and physicians have varying incentives to utilize the EHR systems. These can be predisposed by the reality that nurses tend to labor in a single setting and will consequently be more often exposed to the EHR (Silow-Carroll, Edwards & Rodin 2012, 1).

Nurses' settings are contrasted to doctors who tend to implement their duties in several settings, both within and outside the health care facilities. (Networking health 2000) Comparatively, not many pieces of research have appraised EHRs concerning their impact on medical work or practices of nurses. Therefore, there is a gap for further studies concerning the impacts of EHRs on nurses and patient fulfillment, medication error reduction, clinical instruction compliance, and client outcomes. The capability of healthcare providers, like nurses, to acquire and use an EHR program quickly and professionally is believed to reduce facility costs for preparation, enhance patient security, and support meaningful use of finances Silow-Carroll et al (2012, 1) Nurses often report patients' progress using consistent forms or care strategy, while physicians hardly ever use standardized plan to write their clinical outcomes.

The duties and responsibility of nurses and physicians are different and may impact their performance. Those may enlighten why nurses tend to be more time proficient than doctors. Both parties also vary in their work procedures. For instance, nurses are a component of a care group and require to verbally transmitting data to their coworkers at the end of their work shift according to Carroll, Williams and Gallivan (2012, 93). Shift report handoffs require technical communication that is, the transmission of information about a patient relevant to their condition and care during the next shift. With EHRs in place such delays are avoided since the program is a real-time program.

3 Purpose of the thesis and Research Question

The purpose of this study is to find out how does electronic health records impacts nurses' work practice efficiency in their daily work routine based on the literature review. Understanding the determinants and the nurse's opinions on EHR is essential for the further implantation of EHR in

nursing practice. This study will also determine if nurses using electronic health record understand the beneficial effects of EHR.

The study is based on the numerous systematic evaluations done by other experts to quantify the time variation between computer- and paper-based records. EHRs are essential for the evaluation of practices of physicians and nurses. Time efficiency is among possible results and benefits, for which the achievement of EHR incorporation is appraisable (Synder & Oliver 2014, 18). Studies in this analysis also reported on patient care efficiencies, user contentment and accuracy of the data, completeness of data documented, and the overall impact on performance. Time efficiency is documented as an essential catalyst or barrier of EHR execution, and, as a result, needs to be assessed with meticulous methodologies.

For the past few years, a sizeable number of countries have utilizing the spread of information technology (IT) to increase efficiency in the delivery of various services governance including healthcare delivery ehealth. The Nordic countries have not been exception. While some countries turned to a dedicated eHealth strategy only recently - sometimes developed from earlier and wider Information Society or health system action plans, in others, second or third generation strategies can be found Dobrev, Haesner, Husing, Korte, Meyer (2008, 42).

Research Question of the study:

In what ways do Electronic Health Record impact nurse´s work practice efficiency?

A relatively small number of studies have appraised EHRs with respect to their impact on nurses' job. The studies have done so in contrast with the bigger body of labor on the impacts of EHRs on nurses and patient satisfaction, medication fault reduction, clinical guideline conformity, risk decrease, and patient results (Synder et al 2014, 18). The study evaluates the impact of EHRs system on nurses' work efficiencies. Although there is a growing institution of study on how EHRs impact nursing care practices, very few researches have concentrated on how EHRs influence the time nurses use in patient care practices. The scope of the study is based on empirical findings

since there is no time and resources to carry out primary research and do surveys. Therefore, the study is based on secondary data to compile and analyze the research question and objective.

4 Theoretical Background

4.1 Electronic Health Records

The EHR records instrument that yields data that are valuable in enhancing clients' safety, assessing care quality, optimizing efficiency, and assessing staffing requirements. (Silow-Carroll et al 2012, 1) even though nurses support the EHR, they also indicate displeasure with its framework and burdensome electronic procedures. This study analyses the views of nurses shared in empirical literatures and it cheers nurses to share their EHR experiences and worries with information technology (IT) experts and dealers and to take their position on board when nursing-based IT decisions are approved (Lavin, Harper, & Barr 2015, 1).

The Nursing Practice Committee (NPC) recommends consistency of evidence-based care procedures, comprising patient enlightening materials and strategy plans, within and ultimately across the care situation. Suitable quality care assessments can only be prepared when such consistent processes and commodities are applicable (Lavin, et al 2015, 1). If nurses or nurse experts use their resources and do not utilize, for instance, the EHR-based patient training materials, then they are at an inconvenience when digital comparisons within and between organizations are made.

Lavin and co-authors argued that application of non-standard resources will cause documentation to emerge as if nurses do not satisfy patient training and health promotion principles. These authors continued to argue that registered nurses, including APRNs, may protect themselves by claiming that their personal resources are the most modern and most evidence-oriented. If claim is

true, then it is very important that specialty-explicit nurses become included in the connecting and updating of computer-based, patient-education resources to guarantee the appropriateness and the evidence base of all resources, Furthermore, documents created by the EHR ought to be written simply and clearly, in maintaining sound health information and evidence-based patient edification plans and instruments (Lavin, Harper, & Barr 2015, 1).

Nurses may also identify newer electronic recording methods affecting workflow, in which scenario they require to become individually involved in performance design with dealers or with IT section staff. Some may oppose the notion of uniform care procedures when incorrectly viewed it eradicates individualized care. In variation to the misperception, it is imperative to acknowledge that EBP and standardization of care procedures assist in assuring that the superiority of care is maximized for each individual client (Lavin, Harper, & Barr 2015, 1).

EHR is considered a clinical decision maintenance system that is premeditated and executed according to high-quality measures, and is functioning as intended; though, it can still give incorrect clinical information. It is intrinsically difficult for EHR programs to handle precisely or foresee the highly supple and fluid manners in which healthcare is offered in reality. Decision support mechanism recommendations do not suit every clinical situation (Bowman 2013, 4). Uncharacteristic circumstances, like unusual permutation of conditions or local scarcity of resources, are seldom taken into consideration. Systems are incapable of handling all potential exceptions, so at some position, the amount of decision tree choices becomes too huge, and the scheme becomes impracticable to use and maintain. Furthermore, data entry mistakes that result in unfinished or erroneous information in the EHR can result in inappropriate decision support advice or letdown of an alert to be given altogether (Bowman, 2013, 4).

While the acceptance of EHR systems promises many substantial benefits, including improved care and reduced healthcare costs, serious inadvertent consequences from the execution of these systems have surfaced. Poor EHR organization design and indecent use can create EHR-associated errors that put at risk the integrity of the data in the EHR. The move results in errors that imperil patient safety or reduce the value of care. These unintentional outcomes also may enlarge fraud

and mistreatment and can have severe legal implications. This literature review assesses the impact of EHR systems to nurses' routine practices on the quality of care and proposed resolutions to enhance EHR-related benefits (Bowman 2013, 1).

According to Bowman (2013 1-2), the increasing scope and involvedness of tasks nurses can perform with EHRs, in comparison with unprecedented stress to rapidly accept EHR systems augment the potential for EHR-associated patient safety risks. In a multipart healthcare setting, in which communications with other computer systems and provider performance impact how the programs work, it is demanding for nurses and other users to predict potential problems or comprehend how a failure happened. In addition to EHR device functions and characteristics that can effectively contribute to suboptimal health service quality, mistakes can occur from improper system application. Usability faults happen as an effect of system intricacy, lack of user-friendly capabilities, performance incompatibility, or inadequacies of the user.

Faulty operations could mislead nurses where there is a baffling screen exhibit when erroneous values result from an encoding error that wrongly exchanges from one quantity system to another. Even though EHR systems do not directly influence patient care in exclusive of human intervention, expertise is regularly so intricate that clinicians are incapable of analyzing or understanding its calculations and consequently cannot exercise proficient user intervention. For instance, nurses may depend on computer-created diagnoses and treatment commendations without completely comprehending how the algorithm was created or that the prescription did not consider certain medical circumstances or clinical matters that are pertinent to the patient. Also, proficient human intervention relies on users having the motivation, time, and capability of reflecting on and predicaments computer-created data and recommendations, which could not be factual in the midst of operation or in the ICU However, current EHR systems are efficient and user-friendly to minimize problems (Bowman 2013, 5).

EHR systems can change the manner healthcare is provided when these techniques are designed, executed, and used properly. When designed and employed inappropriately, EHRs append a layer of intricacy to the existing complex provision of health care, resulting in unintended unfavorable

consequences like dosing mistakes. Failure to discover serious sicknesses and delays in handling due to pitiable human-computer communications or loss of information are considered drawbacks. Nurses must be aware of these characteristics and functions of EHR systems to work effectively (Bowman 2013, 8).

Menachemi and Taleah (2011, 47) demonstrated that EHR systems have the potential to change the health care scheme from a typically paper-based business to one that uses clinical and supplementary pieces of data to help providers offer higher quality of health services and care to clients. The two authors define EHRs as a longitudinal electronic documentation of patient health details created by one or more experiences in any care provision setting.

The EHR system records contain problems, patient demographics, medications, and progress notes, vital symbols, past health history, laboratory data, immunizations, and radiology reports. Some of the essential benefits allied to EHRs include the capability of easily accessing computerized documents and the eradication of pitiable penmanship, which has traditionally beleaguered the medical plan. EHR systems can entail numerous potential potentials, but three functionalities seize immense promise in enhancing the value of care and minimizing costs at the health provision system level. These three main functionalities include health information exchange (HIE), clinical decision support (CDS) instruments, and computerized physician order entry (CPOE) programs. EHRs employing CDS instruments have been empirically associated with an increased observance of evidence-based clinical strategy and efficient care. Despite the ideal intention of care providers, several factors may upshot in patient experiences that do not stick to best practice guiding principle. However, nurses are in a better position being conversant with these systems so as to offer effective services (Menachemi & Taleah 2011, 49).

4.2 Nurse´s Work Practice Efficiency

Evidently, many studies have demonstrated that nurses are aware of the EHRs benefits. According to Arevalo (2005, 1-6) inappropriate and inefficient scheduling tasks in health service provision are as much a predicament in providing quality client care and managing medical expenses, as the

labor force shortage. The author further points out that one way to achieve efficiency is by preventing inconsistency in the health care provision procedures so as to utilize properly the available workforce. According to the experts, the variability in the everyday patient survey is an amalgamation of the natural (uncontainable) variability arrived at by the crisis unit and the artificial. Variability has an undeviating impact on hospice nurses. Most health institutions now estimate nursing staff considering an average patient requirement. However, crests in demand generate stress for nurses and impact quality of care. Similarly, the American Nurses Association (ANA) Health Care Agenda 2005 statement stated that enhancing the work setting ultimately depends on nurse staffing phases.

The staffing phases are dependent on the development and appraisal of staffing mechanisms that will establish safe and suitable staffing stages and skill mix that are associated with patient results. Appropriate staffing ratios are essential matter, but proper concentration to the technical perspectives of patient flow and manageable aspects of requirements can also add greatly to evening the flow of effort for nurses. However, proper staffing without effective documentation systems will not achieve desirable efficiency outcomes Therefore, apart from proper staffing, nurses are encouraged to train of EHR to enhance their efficiency in monitoring and reporting patients' conditions (Arevalo 2005, 6).

Efficiency in the provision of health service is illustrated as avoiding misuse, including misuse of equipment, provisions, and concepts. Several pieces of research have reported the lack of effectiveness in existing EHR documentation systems. A time-and-motion research of occupant physicians' note-documenting tasks using an HER demonstrated a high fragmentation in nursing work. Tasks that interrupted records included: patient requests, calls, and frequent changeovers between various forms of documentation frameworks. Researchers proposed that clinicians depend on synthesis instead of the composition to write progress records (Lavin, Harper, & Barr 2015, 41).

Highlighting and using single phrases or words from charts to devise a new note expressive of the client at the current position in time demonstrate newer systems that promote synthesis. Another methodology would be the application of the ready assortment of clinically pertinent trend lines to

show the patient's existing clinical condition. Research is required to contrast the quality of such documentation and to establish if it is less susceptible to disintegration than current charting techniques. This study needs to embrace the study of the records by direct care nurses according to Lavin et al (2015, 42).

A time and movement study handling nurses' labor in the acute care situation discovered that collecting, inputting, and retrieving data consumed a large part of nurses' time. This strategy resulted in significantly less nursing moment available for patient services Lavin et al (2015, 43). A latest hospital-based research by Englebright et al. in 2014 created a definition of fundamental nursing care record for the adult clients and incorporated it into an EHR. The authors summarized that this newer technique minimized or eradicated documentation that did not directly promote patient care. These authors recommended the application of alternative choices for recording non-patient-care-associated data and use of EHR systems to help nurse's record and communicate fundamental care issues. It is evident that EHR systems can assist influence nurses' work practice routine efficiency.

Lavin and co-authors continued to argue that efficiency-related issues need proper handling. They pointed out that if unaddressed, nurses and clinicians must minimize electronic documentation. Given an alternative between offering high quality care and superiority documentation within an incompetent EHR system, it is secure to offer the care needed and reduce documentation period than to interfere with care to be positive that credentials is complete. Understanding and remedying the etiology of similar documentation work-practices, and all extra work-tasks, is essential to enhancing the healthcare program (Lavin et al 2015, 43).

Direct care nurses documentation that EHR issues also influence the quality of nursing reporting. These include the rigidity of the figure of available alternatives for inputting nursing information; a lack of relevant patient details presented in a readily available and understandable manner to maintain critical decision-making. On the other hand, drawbacks connected to over-reliance on the checklist superiority of nursing records and the comparatively little awareness given to diagnostic-based interventions and their assessment are also considered. Such matters lead to poor visibility,

documentation, and possible wrong use of clinical data that may contravene patient results Lavin et al (2015, 43).

For example, Poissant and co-authors in 2005 carried out eleven studies examining the impact of EHRs on time effectiveness of nurses. The authors presented the main features of these researches in a summarized Table 2 shown below Poissant et al (2005, 509). The research by Bosman et al. emerges twice in the table because of the report of time efficiencies employing two diverse sampling units. Likewise, Pierpont and Thilgen (1995, 509) documented two series of data but employed the same sampling samples. Among all researches, six produced a decrease in documentation time when employing a computer in nursing activities. Among the six, the comparative time differences varied from 22.1% to 245.1% and both of these researches evaluated the time efficiency of bedside notes or computerized programs that were available through either bedside notes or central station computers. Two pieces of research discovered that bedside notes increased documentation period (relative time variances of 7.7% and 32.9%, correspondingly Poissant et al (2005, 509). One research reported diverse results relying on the specific context of the information being reported.

Documenting the admittance data was time competent for nurses while registration data required extra time when inputted on the computer instead of writing on paper. The biggest time inefficiency documented is accredited to the exploitation of a handheld device, personal digital assistant (PDA) that needed 128.4% extra time than normal paper charting. The research was the only one carried out in a home situation. The PDA was employed to input data on an activity of daily living (ADL) appraisal instrument and was employed as an autonomous device with no data swap at the time of data input (Poissant et al 2005, 509).

Table 1: Results on documenting tasks (Poissant et al 2005)

Authors	Study Design	Method	Sampling Unit Paper (No.)/Computer (No.)	Time Period From Implementation to Evaluation
Bosman et al.[35] (2003)	RCT crossover	Time & motion	Patients (55)/(59)	7 mo
Ammenwerth et al.[41] (2001)	RCT	Self-report	Patients (19)/(19)	7 wk
Kovner et al.[40] (1997)	Pre-post	Self-report	Patients (198)/(230)	≈1 yr
Wong et al.[39] (2003)	Pre-post	Time & motion	Working shift (10)/(10)	6 mo
Menke et al.[15] (2001)	Pre-post	Time & motion	Working shifts (12)/(12)	NA
Marasovic et al.[37] (1997)	Cross-sectional with controls	Work sampling	Working shifts (5)/(6) Obs (2,098)/(1,562)	NA
Pabst et al.[16] (1996)	Pre-post	Work sampling	Working shifts NA/NA	6 mo
Pierpont & Thilgen[36] (1995)	Pre-post	Work sampling	Working shifts (49)/(52)	3 mo
Minda & Bundage[38] (1994)	Cross-sectional	Time & motion	Working shifts total = 40	≈1 mo
Hinson et al.[42] (1993)	Pre-post	Work sampling	Working shifts (20)/(20)	6 mo
Bosman et al.[35] (2003)	RCT crossover	Work sampling	Working shifts (28)/(27)	7 mo
Bradshaw et al.[13] (1989)**	Pre-post	Work sampling	Working shifts (21)/(21) Obs (7,775)/(8,050)	6 mo

NA = Not Available; RCT = Randomized, Controlled Trial.
*Admission procedure.
†Estimated as task occurrence × mean duration.
‡Unable to calculate the 95% CI due to lack of SD reporting.
§Unable to calculate the 95% CI due to nonreporting of number of observations.

From the table, it is evident that nurses' time efficiencies can be achieved through EHRs systems.

Miller et al (2014, 8), argued that the current healthcare program, both system-based and at the facility phases, is encountering changes associated with EHR usage Transformation while transitioning to EHRs affects the whole healthcare institution and directly impacts nurses' efforts in providing quality patient care. Nurses are the main number of workers in acute-care environments and how efficiently nurses are capable of using EHRs has the utmost potential impact on patient service provision. As healthcare institutions facilitate EHR systems applications; the changeover to EHRs impacts nurses' documentation, service provision, and staffing. For many decades nurses have long listen to "if it wasn't charted, it wasn't done" In the health service profession, computer recording can assist in reducing documentation deficiencies.

The benefits are achievable since EHR systems timely remind a nurse to graph essential care aspects, generating an absolute clinical documentation of a patient's situation. Nursing course education offers the nurse with the basic and specific proficient nursing skills for using the CDS systems integrated into EHRs. Nurses also are educated to use EHRs to finish complex clinical computations, identify possible drug interactions, and speedily scan a large quantity of data if the suitable electronic documents are available. In the history, academic circles have struggled with what is essential to incorporate in each stage of nursing training because the field lacked consciousness of the skills needed for nurses to effectively employ EHRs. Nowadays, nursing program courses are working to devise curricula that incorporate up to date information technology, like integrating simulated EHRs to the coursework for the evaluations and care strategies completed throughout nursing rotations. The authors pointed out that nurses entering practice will require filling electronic care strategies, collect data necessary for patient edification, and complete discharge strategies. Another significant documentation feature for the nursing trainees is learning how to efficiently document in real-time instead of waiting until the shift is over (Miller et al 2014, 9-11).

The principle of an evocative quantitative study carried out was to recognize what, if any, gaps prevailed between the informatics skills and knowledge self-documented by novice nurses. The novice nurses demonstrated awareness of informatics skills and knowledge in acute-care settings as documented by their managers. The concentration was not on information expertise skills and knowledge alone, as it was comprehended that the novice nurse would not acquire the skills of information expertise, which consist of systems management, computer usages, and consider for the end-user connection. Identifying any prevailing informatics skill and knowledge gaps may assist nursing tutors and nursing managers in acute-care environments comprehend what can be done to enhance nursing teaching and, consequently, better organize nurses to employ EHRs effectively in acute-care conditions (Miller et al. 2014, 11).

4.3 Benefits of Electronic Health Records

Information technology has benefited many organizations in organizing their data in real time for easy accessibility. In the health sector, electronic health records have improved the quality of care, time efficiencies, improved performance, and reduced costs. For example, CPOE systems permit nurses to input orders such as drugs, radiology, laboratory tests, and physical therapy into a system instead of writing on paper. Computerization of this procedure abolishes potentially hazardous medical mistakes caused by unfortunate penmanship of nurses or doctors (Menachemi & Taleah 2011, 48).

The system also makes the ordering course more efficient since pharmacy and nursing personnel do not need to ask for clarification or to request missing data from unreadable or unfinished orders. Previous pieces of research suggest that grave medication mistakes can be minimized by approximately 55% when a CPOE program is used unaccompanied. Furthermore by 83% when integrated with a CDS program that generates alarms based on what the nurse orders once health information is accessible electronically to nurses and doctors, EHRs aid the sharing of patient data through health information exchange (HIE). HIE is the procedure of sharing patient details in electronic health information among various organizations and can generate many proficiencies in the health care service provision. By permitting the safe and potentially real-time distribution of patient data, HIE can decrease costly surplus tests that are ordered since one healthcare provider cannot acquire the clinical information kept at another provider's site. In this system, patients characteristically have data kept in a variety of sites where they get care (Menachemi & Taleah 2011, 48).

Researchers have assessed the gains of EHRs regarding clinical, institutional, and societal results, clinical outcomes has incorporated a reduction in medical mistakes, enhancement in the quality of care, and another upgrading in patient-level procedures that illustrate the suitability of care, On the other hand, institutional outcomes include such issues as financial and functional performance, also satisfaction among nurses and patients who employ EHRs. Lastly, societal results comprise being enhanced to conduct a study and achieving better population healthiness (Menachemi and Taleah 2011, 49).

The application of EHRs can minimize the superfluous use of experiments or the requirement to mail paper for test results to different providers by making patient information more readily accessible, EHRs minimize costs associated with chart also by pulling supplies required to sustain paper charts. Researchers have demonstrated that an EHR rather than a paper file can minimize transcript costs through the area of paper records and other prepared documentation measures. Examiners have also discovered a correlation between EHR use and nurse contentment with their practices, also their career satisfaction. According to several studies, nurses' satisfaction must be a priority in health care institutions. Satisfaction is connected with enhanced quality of care, improved prescribing conducts, and augmented retention in medical activities, mostly those in underserved locations Menachemi and Taleah (2011, 50-51).

According to Lee (2006, 1376 -1378) on nurses' opinions on computer use, he claims that nurses' experience, knowledge, and decisions were improved through computer technology. The author studied nurses' opinions of a nursing information technology one-year post-execution and found disappointment with software, hardware, and interpersonal associations Perception of self-assurance was investigated in correlation with nurses and computer recognition. Ammenwerth, Mansmann, Iller, and Eichstadter (2003, 69) discovered nurses' self-confidence concerning computer use impacted acceptance of computers Burnie (2010, 3). The authenticity of a national health information system may be a predicament. On the other hand, Jha et al. (2009, 1632) studied staffs of the American Hospital Association and discovered just about 1.5% of the entire US hospitals had an all-inclusive medical record system and an extra 7.6% had fundamental systems. The study found that the execution barriers included capital worries and maintenance expenditure.

In addition to these results, it is very important to bear in mind nurses make up the bulk of technology providers in health care institutions. Nurses' perceptions are important in establishing the success of computerization in the health sector. An imperative area of nursing study involves efforts to find out methods to convene nurses' requirements about computer applications. As information technology broadens in the health sector, it is anticipated that improved efficiency in nursing recording will be a result. The changeover from paper to automated documentation programs has demonstrated to be a predicament in hospitals. Many studies were done to evaluate

nurses' attitudes in connection with the development of strategies to advance computerization (Burnie 2010, 3-11).

Health professionals have acknowledged that computers have become an essential part of nursing. As computerization is augmented, comprehending nurses' can allow the transition attitudes associated with computers. Burkes (1991, 195) devised a knowledge, contentment, and motivation study. The viewpoints and fraction of the demographic statistics section of the device consisted of an acceptance of the Stronge-Brodt feedback form. The questionnaire was structured in five sections namely (a) knowledge, (b) beliefs, (c) satisfaction, (d) motivation, and (e) individual uniqueness relating to computer application in nursing. The knowledge measurement scale comprised of 12 statements with false, true, and unsure answer possibilities. The beliefs measurement scale comprised of 18 statements with answers varying from strongly disagree, strongly agree, agree, disagree, and uncertain. The satisfaction and acceptance measurement scales had 21 declarations using the same answers as the beliefs level. The motivation measurement scale had 17 statements with similar responses to the satisfaction and acceptance and belief scales. The person and demographic measurement scale appraised 13 computer capabilities comprising charting, arrangement medications, word processing or encoding, and months the participants had acknowledged how to utilize the various computer processes.

The individual and demographic measuring scale also evaluated highest nursing degree, year of completion, months practiced as a nurse, years at the institution, current job title, shift, and service status. The instrument was verified using four nurses from the nursing information programs steering board with 95% concurrence among reviewers Burkes (1991, 195). Tool dependability was validated for internal reliability with the split-half technique and the Cronbach's alpha coefficient. Amendments were made to the beliefs subdivision of the tool to boost the alpha coefficient from a variance of -.396 to .655 to a variance of .534 to .655 Burnie (2010, 11). The study demonstrated that comprehending how nurses perceive the documentation procedure affects expansion of computer technology and instructive programs. Many studies have been finished to evaluate nurses' perceptions comprising satisfaction, confidence, efficiency, and acceptance in the utilization of computerized documentation programs. The researchers concluded that the nursing documentation

is an imperative aspect of the patient's experimental image and is an issue in communication among health care personnel concerning patient care.

5 Methodology

Pico strategy will be used to define, formulate and answer the research question. PICO has been defined as a method of putting together a search strategy that allows more evidenced based approach in searching literature in the databases. The table below shows the search strategy based on the elements of PICO (O'Connor, Anderson, Goodell & Sargeant 2013, 28)

The PICO frameworks are used extensively in nursing and health study to assist in managing and breaking down study questions. Applying PICO strategy helps a researcher to recognize the key ideas in study question develop fitting search phrases and determine the exclusion and inclusion criteria Wakefield (2014, 39). PICO is most extensively used in quantitative study questions. The fundamentals are described subsequently and can be employed as necessary. Not all basics will apply, and the study must just use those that associate with research question Santos (2007, 508). PICO is not important if the research question does not precisely fit the available format. The PICO framework shows that some elements are essential while other elements do not apply to all research questions. It is all measure of the procedure of helping to examine research question in aspects and develop a successful search strategy (Santos 2007, 508).

Health experts demonstrate that evidence-based practices (EBP) are the use of the ideal scientific confirmation to sustain the clinical decision verdicts. The recognition of the best evidence needs the formation of a suitable research question and evaluation of the literature. The EBP proposes that clinical predicaments that emerge from care practices, teaching or study be designed and structured using the PICO approach. PICO is a short form for Patient, Intervention, Comparison and Outcome (Santos 2007, 508).

These four elements are the indispensable elements of the study question in EBP and of the edifice of the study question for the literature review. The PICO strategy applies in building several research questions, instigated from clinical carryout, human and substance resource administration, the study of symptom evaluation tools, among others. The well constructed and adequate research question permits for the accurate definition of which evidence or information is needed to solve the clinical research question. It also helps in capitalizing on the recuperation of proof in the database, concentrates on the study scope and prevents unnecessary analysis. The application of the PICO plan reveals proficient in the efficient recuperation of evidence from key digital database, MEDLINE/PubMed. These databases offer a crossing point, in a beta (test) edition, for the direct inclusion of the four elements of the PICO policy (Santos 2007, 510).

This thesis employs PICO search strategy to gather and compile data. In addition, search diagram or table is used as a reference material to ensure that the study complies with the strategy chosen. Evidence-based models employ a strategy for framing a research question, locating, evaluating, assessing, and reiterating as desired. PICO is one of the evidence-based frameworks applicable in health care studies. PICO (T) components comprise of Problem/Population/Patient/, Intervention/Indicator, Comparison, Outcome, and optional Time element or Type of research.

For example the Table 1 and Figure 1 below shows how the PICO strategy was used to describe all the components related to the identified problem and to structure the research question.
In what ways does Electronic Health Records impacts nurse´s work practice efficiency?

Table 2: PICO strategy

Strategy	Breakdown

P (Problem or Patient or Population)	nurse´s work practice efficiency
I (intervention/indicator)	Electronic Health Records
C (comparison)	No Electronic Health Records; other solution; Manual records
O (outcome of interest)	Positive impacts

- ✓ Population

  Addressing a specific population is essential In this case the population being addressed are nursing staff and all the caregivers. They are the key users of EHR.

- ✓ Intervention

  The main intervention in this case is the key words used in searching the research articles, EHR; CPR; EPR and EMR according to table 1.

- ✓ Comparison

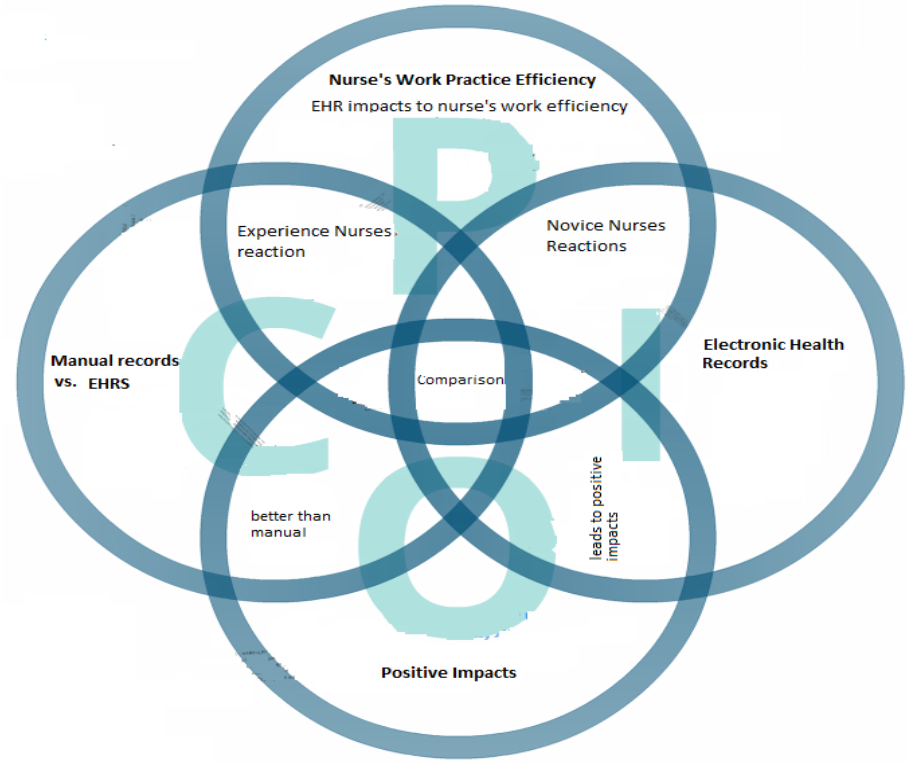
  The alternative to compare the intervention used was electronic health records and paper work.

- ✓ Outcome

  This is the effect of the intervention. Efficiency, work practice and productivity was used as the outcome. A good primary outcome should be easily quantifiable, specific, valid, reproducible, and

appropriate to research questions (Thabane, Thomas, Ye, & Paul, 2009, 56)

Figure 1: PICO



An extensive study of the literature is done using HEALTHSTAR, CINAHL, MEDLINE, and Current Health sources from year 1980 to 2015. Search approaches are precise to the database and incorporated the Medical Subject Headings (MeSH) connected with key terms that reflected EHRs and performance. The MEDLINE study strategy comprise of the terms such as electronic records, health informatics, computerized patient records, medical informatics, medical records systems, workflow, information systems, motion and time, task performance and assessment, work redesign. When researching the HealthSTAR and CINAHL databases, the key terms efficiencies,

organizational, sanatorium information programs, and workload are accumulated to the study strategy applicable for the MEDLINE record.

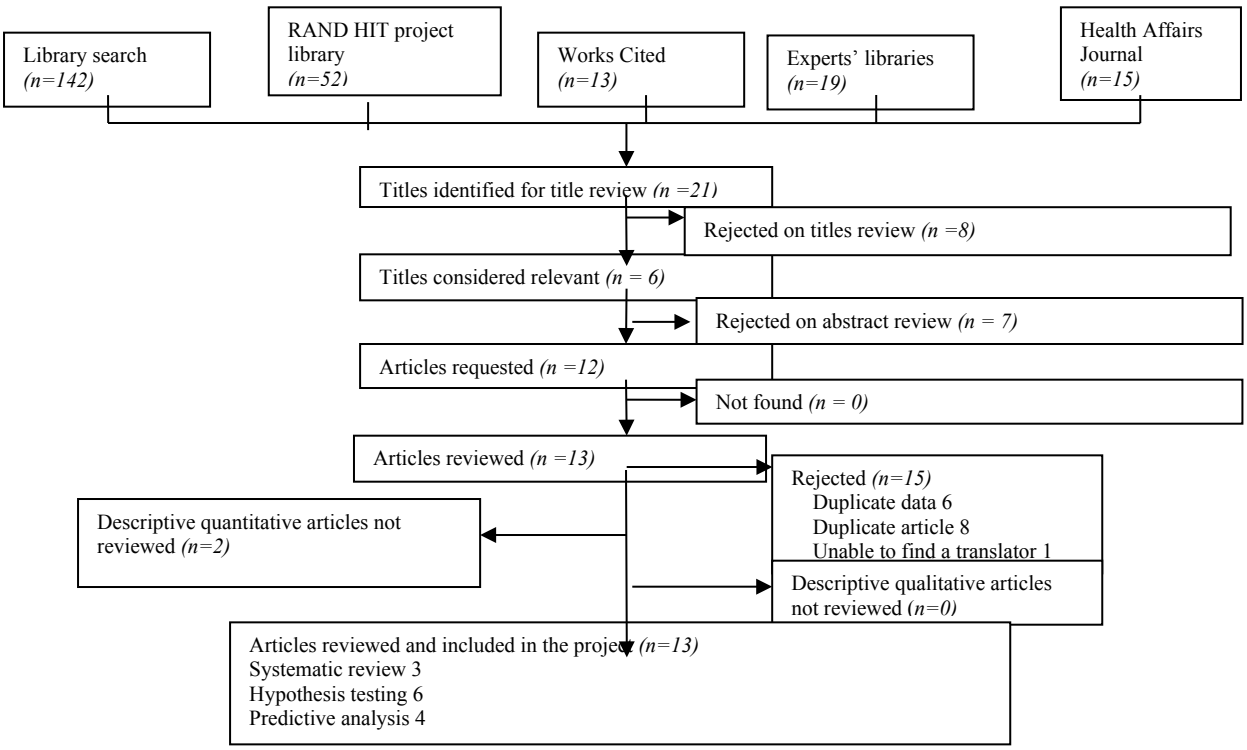


Figure 1: Search Diagram

6 Findings

From the empirical findings, it is evident that nurses play an essential role in the acquisition, evaluation and application of the EHRs. The study has shown that EHRs improves the quality of care and performance, limit costs, and time efficiency.

Figure 3 below presents barriers faced by hospitals with and those without EHRs. Hospitals with EHRs have complete electronic records programs and fundamental electronic-records systems. The systems demonstrate that doctor notes and nursing evaluations are important factors in health organizations.

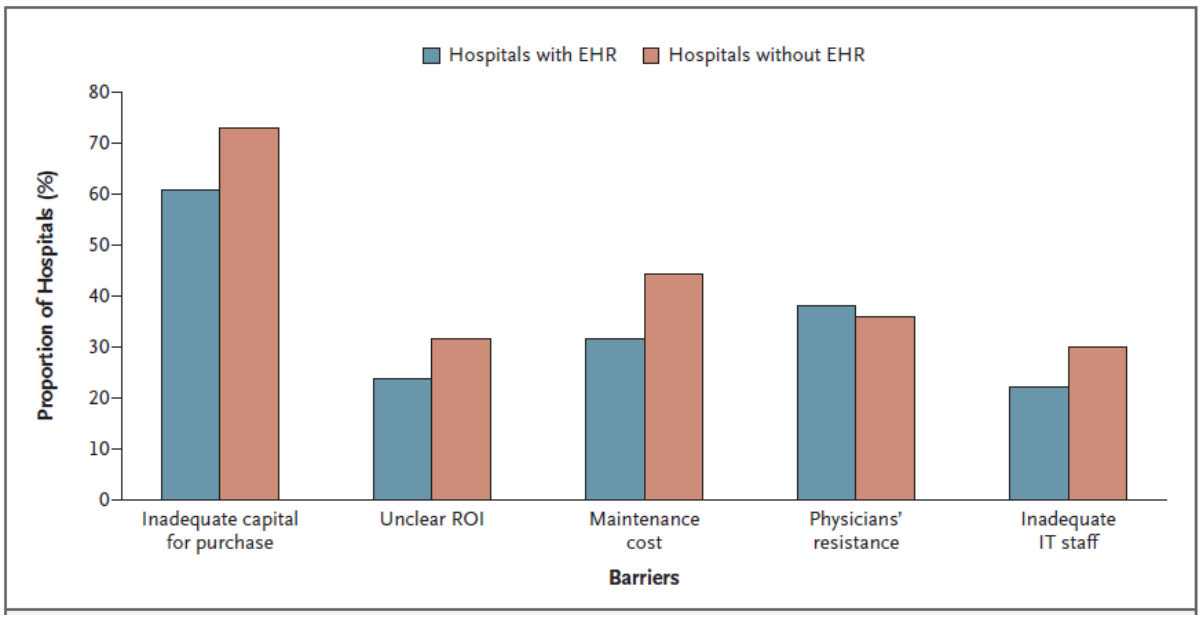


Figure 2: Barries (Jha et al. 2009)

From the Figure, it is clear that hospitals with EHRs have fewer barriers compared with hospitals without the system. In a broad view without considering nurses' opinions, it is clear EHRs are essential for healthcare organizations.

6.1 Quality Care:

Several clinical results that have been a focal point of EHRs studies associate with quality of care and patient security. The quality of care is described as doing the correct thing at the correct time in the correct manner to the right individual and having the most excellent possible outcomes. The studies showed that quality of care comprises of six dimensions; however, most EHR study has concentrated on patient safety, efficiency and effectiveness. EHR systems attempt to trounce

quality predicaments, and investigators have concentrated on precautionary services to inspect how EHRs can enhance adherence capacities. For instance, investigators found that computerized nurse reminders improved the use of influenza and pneumococcal immunizations from virtually 0% to 35% and 50%, correspondingly, for hospitalized clients (Menachemi & Taleah 2011, 49-50).

On the other hand, researchers have discovered that physicians employing an EHR had less paid malpractice assertions. Explicitly, the researchers discovered that 6.1% of nurses with an EHR had a record of paid malpractice claims contrasted to 10.8% of nurses without EHRs. This decrease is potentially the consequence of augmented communication among healthcare providers, augmented legibility and comprehensiveness of patient records, and boosted adherence to clinical guiding principal Menachemi and Taleah (2011). IOM also highlighted the need for extensive adoption of EHRs as a fundamental constituent of a novel health information technology (HIT) framework designed to enhance health care quality (Campbell et al 2011, 1).

6.2 Time Efficiency

Retrieval or observing of information is a component of the occupation procedures of both nurses and doctors. However, nurses believe that the process is much more complicatedly to the documentation procedure of physicians. The nurses agreed that time efficiency is very crucial to their performance. They believe that with EHRs, time efficiency is achievable. In EHRs systems, time efficiencies are witnessed in CPOE systems that integrate retrieval, viewing of data, data input, and, in numerous cases, reactions to reminders and alerts. These extra factors are hard to capture by work-sampling methods or time and motion as both have inadequate capacity in compiling simultaneous actions. The extra factors may have led to the extra time that nurses and doctors take to record or enter orders into a system. (Poissant et al 2005, 511)

Poissant et al (2005) did a survey to test time efficiencies, in their research of the 23 studies, only two employed self-reported time and the two documented an increase in recording time with

computer-based systems. Among all prescreened papers, one-third carried out their assessment procedure within three months of the execution of the computerized program. Overall, these authors tend to reveal positive results with a decrease in recording time with computer-based systems (weighted mean, 234.0%/work shifts); however, a trivial boost at the patient level (weighted mean, 5.7%). In comparison, researches that were carried out more than three months following system's execution had a positive impact on time efficiency. The result was evidently inauspicious in relation to clients (weighted mean, 66.1%) but positive at the working shifts phases (weighted mean, 210.0%). Even though three of the initial researches conducted in the 1980s demonstrate a boost in documentation time subsequent computer application, no trend toward augmented or reduced efficiency could be recognized among the more recent researches with nurses.

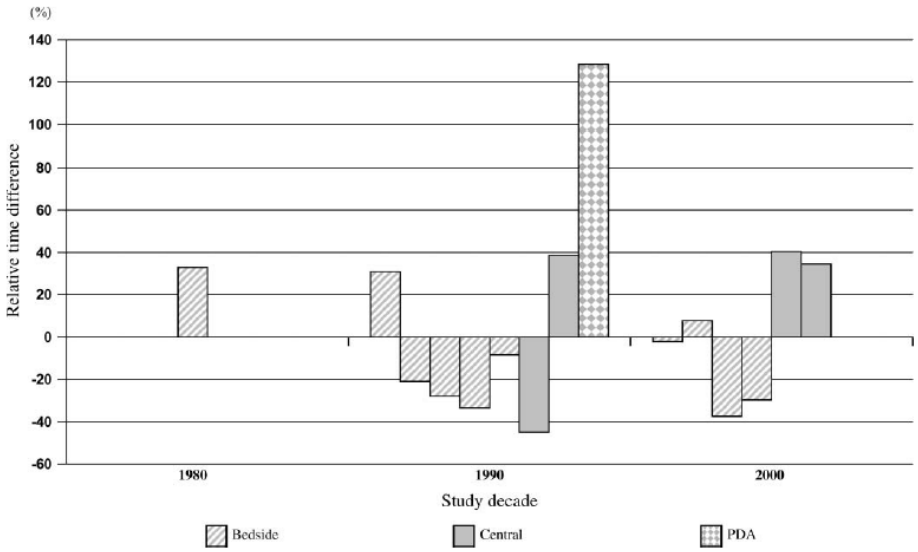


Figure 3: Comparison of unweighted comparative time differences amongst nurses by study decade. (Poissant et al. 2005)

From Figure 4 above, it is evident that time efficiencies have increased over the last decades. Nurses enjoy improved real-time recording due to EHRs systems.

Miller et al. (2014, 25) study has shown that nurses have time to be comfortable using EHR. The study demonstrated that new or novice nurses and nurse managers were requested to document the period it took nurses to become relaxed using EHRs. As demonstrated in Figure 5, novice nurses and nurse administrators did not concur. While more than 70 % of novice nurses said they realized it

took two months for them to get at ease using the HER, over 60 % of nurse managers documented it took novice nurses over two months to be conversant with EHRs.

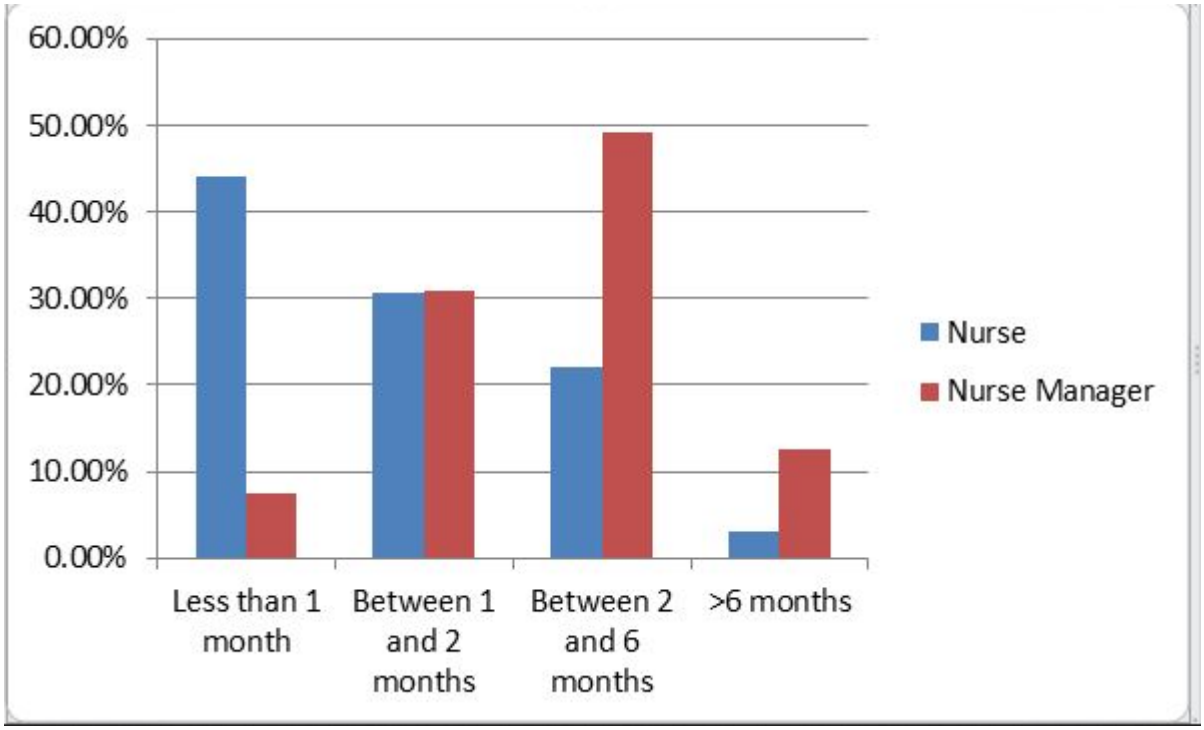


Figure 4: Time to be comfortable using EHRs. Miller et al. (2014)

The result shows the importance of nurses having EHRs in their duties to improve performance. For instance, nurses are a component of a care group and require to verbally transmitting data to their coworkers at the end of their work shifts. With EHRs in place, such delays are avoided since the program is a real-time program.

6.3 Cost

In a study by Jha et al (2009, 1636), it was not clear whether the benefits of an electronic-records program in some clinical department outweigh the hypothetical hazards presented during healthcare assessment. However, the respondents identified financial matters as the main barriers to acceptance, dwarfing matters like resistance on the part of nurses. From a policy viewpoint, the study data recommend that rewarding hospitals for using EHRs may play a vital role in an inclusive approach to inspiring the stretch of hospital electronic records programs. Generating incentives for boosting information-technology personnel and balancing information technology principles and creating a deterrent for not using similar technology may also be supportive approaches.

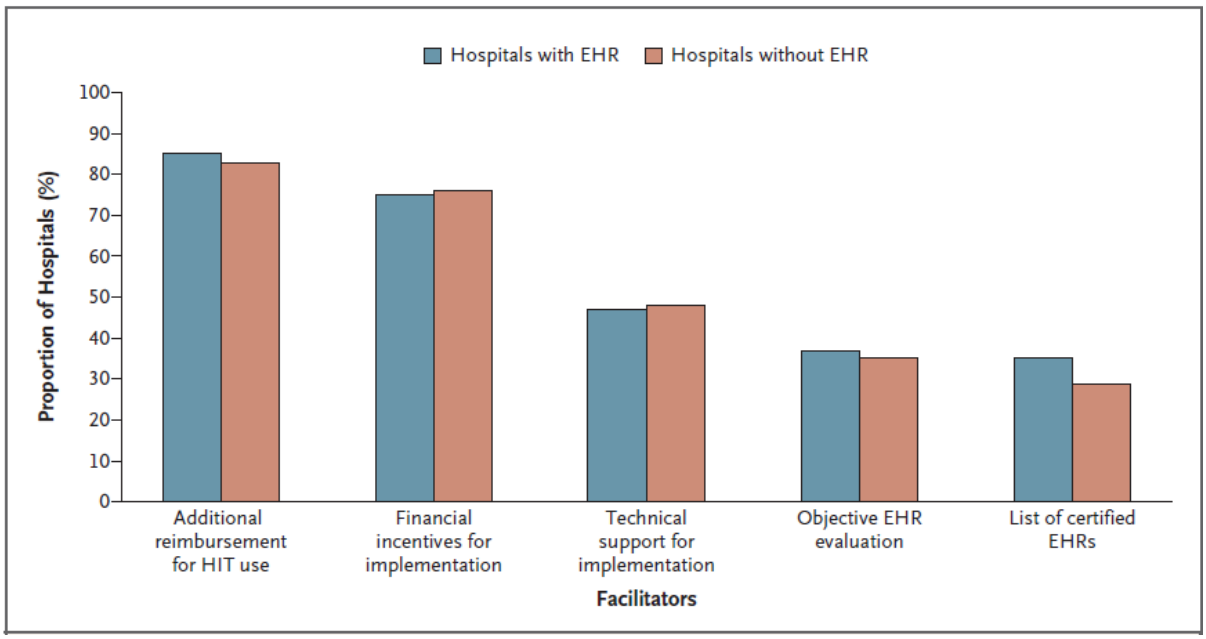


Figure 5: Facilitators. Jha et al. (2009)

Figure 6 present a comparison of facilitators in hospitals regarding EHRs. The figure indicates that hospitals with EHRs had reduced financial incentives for implementation and technical support. This outcome is a demonstration of reduced cost in technology usage.

According to (Menachemi & Taleah 2011, 50) they recommended the use of EHRs in healthcare organizations due to cost benefits associated. They also acknowledged that the application of EHRs could minimize the superfluous use of experiments or the requirement to mail paper of test results for different providers. By making patient information more readily accessible, EHRs minimize costs associated with chart also pulls supplies required to sustain paper charts. Studies have demonstrated that an EHR, not a paper file can consequence in minimized transcript costs through the area of care records and other prepared documentation measures.

6.4 Performance Improvement:

Nurses have established a connection between EHR's use and satisfaction with their career. According to Menachemi & Taleah (2011, 50); Miller et al. (2014, 25) nurses and doctors satisfaction is a priority in healthcare institutions. The satisfaction is connected with better quality of care, improved prescribing conducts, and augmented retention in medical duties, mostly those in underserved sections study asked both novice nurses and nurse administrators to report time usage

in their workplace after an HER implementation, category of EHR training acquired, and quantity of training at their place of work.

Table 3 shows response category selections for all three queries and the percent choosing each reply for both novice nurses and managers. As demonstrated in Table 3, a bigger proportion of novice nurses (about 27 %) than nurse administrators (about 15 %) reported their offices had been employing EHRs less than one year. Over 50 % of new nurses and nurse administrators reported their offices had been employing EHRs for over two years. Most novice nurses (approximately 90 %) and nurse managers (about 75 %) acknowledged receiving EHR preparation at their existing workplace. Few (about 20 %) novice nurses and very few (approximately seven percent) nurse administrators reported assignments on EHR use throughout nursing training. The greatest proportion (39 %) of nurses acknowledged acquiring between nine and 16 hours of preparation. The utmost proportion of nurse administrators (33 %) documented receiving over 24 hours of EHR use preparation at their current place of work. Over a quarter of novice nurses (approximately 30 %) and nurse managers (about 26 %) acknowledged receiving below eight hours of education (Miller et al. (2014, 22).

Table 3: Length of EHR use and training. Miller et al. (2014)

	Less than 6 months	6 months - 11 months	1-2 years	>2 years - 5 years	More than 5 years	Total
New/novice nurses	7.66% (17)	19.37% (43)	16.67% (37)	36.04% (80)	20.27% (45)	100.00% (222)
Nurse manager	5.83% (19)	8.90% (29)	20.25% (66)	31.90% (104)	33.13% (108)	100.00% (326)
	I have not received any EHR training	Coursework during nursing school	Classroom hours at your current job	On-the-job training	Other	Other
New/novice nurses	1.53% (6)	20.36% (80)	35.37% (139)	40.71% (160)	2.04% (8)	100.00% (222)
Nurse manager	0.37% (2)	7.09% (38)	40.67% (218)	49.07% (263)	2.80% (15)	100.00% (326)
	None	Fewer than 8 hours	Between 8 and 16 hours	Between 16 and 24 hours	>24 hours	Total
New/novice nurses	0.90% (2)	29.73% (66)	38.74% (86)	14.41% (32)	16.22% (36)	100.00% (222)
Nurse manager	0.31% (1)	26.38% (86)	29.45% (96)	10.74% (35)	33.13% (108)	100.00% (326)

The table shows how importance is EHRs are in healthcare organizations. Greater percentage of nurses is using the system to improve their performance.

The study also shows factors influencing EHR knowledge and skill level. Novice nurses and nurse administrators were requested to report the factors impacting their EHR knowledge and skill level. As revealed in Figure 7, both respondents concurred on the top four factors impacting EHR skill and knowledge stage. These factors are age, prior clinical experience, organization orientation, and unit-specific orientation. They did not concur on the greatest factor impacting their EHR skill and knowledge intensity. The biggest number of nurse administrators reported clinical know-how, while the greatest proportion of new/novice nurses pointed out the factor of age. Miller et al. (2014, par 26).

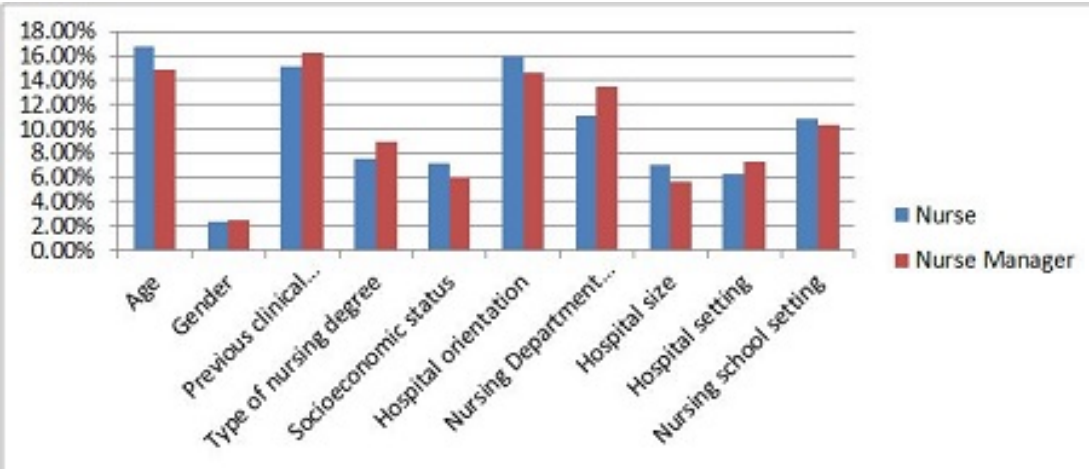


Figure 6: Factors influencing EHR skill and knowledge level (Miller et al. 2014)

Figure 7 is a demonstration that EHRs are essential in a healthcare organization. This assertion is made because skill and knowledge level of staffs are considered only on important areas that affect performance.

6.4 Direct patient care Activities:

STORC is an all-inclusive obstetric charting program designed with the contemporaneous objectives of encouraging clinical care, facilitating clinical result data collection, and encouraging patient security. Evaluations of direct patient care practice count before and after STORC execution are recapped in Figure 8. Even subsequent to modifying for portfolio, direct patient care activity calculation demonstrated an arithmetically significant boost for nurses (13 verses. 16.1, P = 0.04), and patients (residents) (10.9 vs. 15.4, P = 0.02). Even though activity counts for MD attending staff augmented, these variances were not significant. Largely, direct patient care activity augmented considerably (P = 0.03) after execution of STORC (Campbell et al (2011, 9).

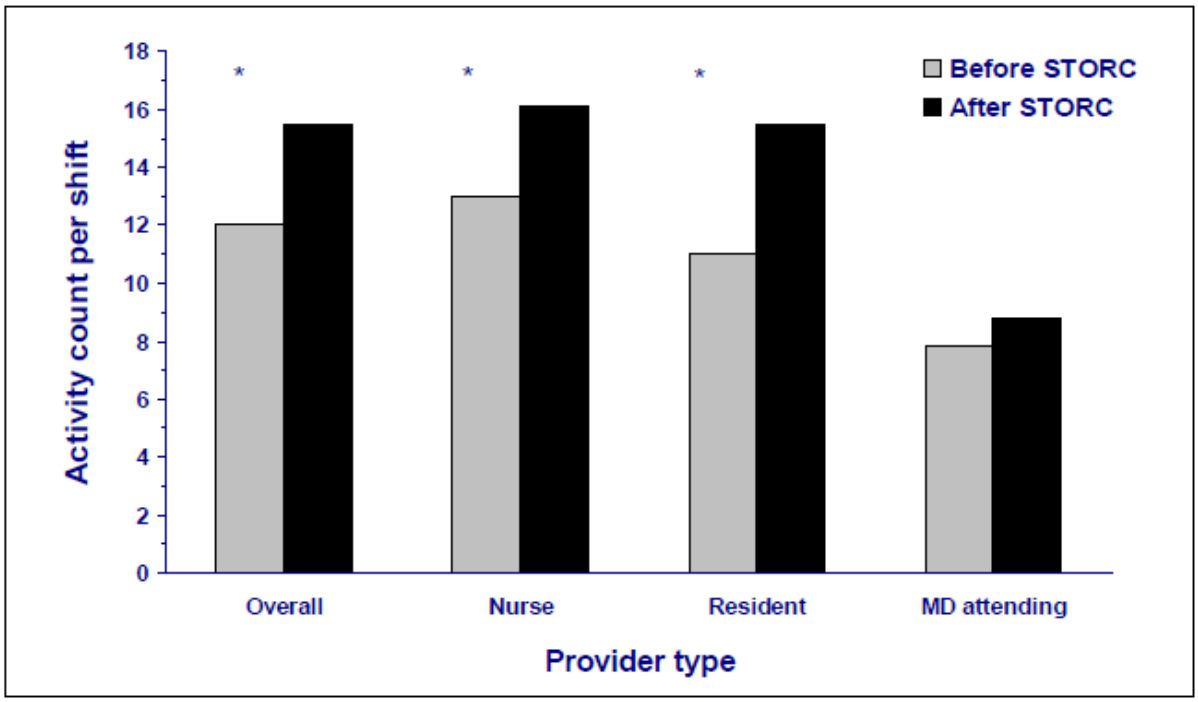


Figure 7: Direct patient care before and after STORC implementation (Campbell et al 2011, 9)

STORC is a component of EHRs systems; therefore, if it increases patient care, EHRs does more.

7 Discussion

The study involved literature health reviews examining the impact of electronic health records. The study has identified EHRs impacts on nurses' work practice efficiency as based on time, quality of care, performance improvement and cost reduction. As a quantitative research, the data compiled are based on empirical findings from other researchers.

According to Menachemi and Taleah (2011, 49) on quality care, most of the reports gave the advantageous impact of electronic records systems in supporting clinical decision. Nurses and physician acknowledged that EHRs system reduce errors and enhance time management. The experts chose a lenient strategy by not demanding the existence of clinical-decision support as a component of a fundamental electronic-records system and by demanding adoption of computer provider order input in the clinical unit. This choice was pertinent since nurses are end users of the system. Nurses spend the bulk of their time offering direct care to patients and anticipate that an EHR could boost this patient contact time and consequently the quality of care provided.

The studies have confirmed that EHRs systems concentrate on patient safety, efficiency and effectiveness, thus boost in nurses-patient contact time. Conversely, provision of quality care needs the documentation of clinical data as an intrinsic feature of scheduled clinical practice and is vital from both occupational and legal standpoints Poissant et al (2005, 505) Consequently, nurses acknowledged that a system is efficient if it reduces documentation time; however, due to quality care the time savings need to translate into improved patient care. For this purpose, in assessing the impact of EHR on nurses' activities, some studies use recording time as a primary result and direct patient care period as a secondary result.

The significance of assessing time efficiency in documentation is also associated with the assessment that augmented time for documentation as one of the most universally stated obstructions to thriving implementation of an EHR. However, with proper training and preparation, nurses and health organizations can minimize the barriers and maximize benefits of EHRs. Electronic health record execution needs substantial investment with most projects standardizing several million dollars for the EHR to be effective, it is necessary that managers are capable of identifying and managing fundamentals of EHR execution that are critical to improving time efficiency of documentation by nurses Poissant, et al (2005, 505). The results support this supposition, with all researches assessing the impact of EHR over operational shift schedules, reporting positive time efficiencies contrasted with those with patients or patient experiences as the sampling components.

In this study review, all literature reviews on nurses, except for CPOE researches, used patients care as their sample of assessment and the majority reported positive impacts of the EHR. Time gains, at the client care level, may be hard to attain and to assess the impact of EHR time on the general clinic or health care day may have resulted in different outcomes for nurses. However, the outstanding outcome is that EHRs have positive impacts nurse's work efficiency. The study suggests that an EHR can be effectively executed in busy, fast-rated, procedure-based hospital departments without negatively affecting practices directly concerning patients. We suppose this result is very imperative to patients, nurses, healthcare organizations, and policymakers (Campbell et al 2011, 9).

On cost aspects, experts believe that a great deal efficiency in the US health care program cannot be achieved without the ever-present use of EHR technologies. The financial incentives incorporated into the HITECH Act are devised to discharge some of the costs linked to EHRs adoption, mainly for smaller institutions where these costs serve as a key barrier. The financial inducements in HITECH, which are accessible through the Medicare and Medicaid systems, are also an effort to rectify some of the misalignment of rewards connected with EHR. This outcome is so because the US regime, through the Medicare and Medicaid systems, is the biggest insurer in the nation. With the reduce cost of operations; nurses believe that their productivities are boosted (Menachemi & Taleah 2011, 53).

7.1 Conclusion

Electronic health records impact nurse´s work practice efficiency in some ways. The results of the study have confirmed the hypothesis that EHRs have positive impacts on nurse's work practice efficiency. In the introduction part, the study background and aim declared. The aim of this study was to find out how does electronic health record impacts nurses' work practice efficiency in their daily work routine. The background reiterated that nurses play an essential role in the acquisition, evaluation and application of the electronic health records (EHRs). The question under discussion, "In what ways does Electronic Health Record impacts nurse´s work practice efficiency" is stated. Lastly, the scope of the study is based on secondary data.

As a secondary research, the study is based on literature review with PICO search strategy. PICO strategy is used to define, formulate and answer the research question. The study employs PICO search strategy to gather and compile data. In addition, search diagram or table is used as a reference material to ensure that the study complies with the strategy chosen.

Under literature review section, PICO three subsections: nurse´s work practice efficiency, electronic health records, and benefits of EHRs, are discussed. The literature review assessed the

impact of EHR systems to nurses' routine practices on the quality of care and proposed resolutions to enhance EHR-related benefits. As well recognized in the health service profession, computer recording can assist in reducing documentation deficiencies. The benefits are achievable since EHR systems timely remind a nurse to graph essential care aspects, generating an absolute clinical documentation of a patient's situation. In the health sector, electronic health records have improved the quality of care, time efficiencies, improved performance, and reduced costs.

On the basis of quality, Menachemi and Taleah (2011) acknowledged that several clinical results that have been a focal point of EHRs studies associate with the quality of care and patient security. Poissant and co-authors (2005) did a survey to test time efficiencies and discovered it is the main benefit and impact EHRs have on nurses' efficiencies. Researchers have also established a connection between EHRs use and nurses satisfaction with their existing practice, also their career satisfaction.

In conclusion, hospitals with EHRs have improved nurses' performance since time is managed effectively between shifts due to real-time recording. With proper timing, nurses can prepare adequately to offer quality care. In addition, nurses' performances improve due to adequate time to prepare and organize themselves. The study was based on literature review that is biased; future research studies should incorporate both primary and secondary research.

7.3 Trustworthiness

Research method in itself is never reliable or unreliable; the trustworthiness of the method is determined in relation to what is being examined Whitbeck (1995, 403-416) The appropriateness of the method used in the literature research can be probed, however when compared to the purpose of this thesis and as proved in the literature search process using PICO can be considered as suitable literature search method. Although a wide search and publication older than 10 years are considered as outdated this was found relevant in this case and was enough for this work. Documenting the inclusion and exclusion criteria according to the figure provided in the findings helps with the repeatability of the study and also brings additional quality to the study

7.4 The limitation of the study

The idea of time efficiency is documented in the health informatics text through quantitative or qualitative outcomes or anecdotal proof, but this study concentrate on quantitative results only. The other limitations are time and finances constraints. Due to these constraints the study was based on secondary data only. Both primary and secondary research data are essential for reliability and validity of a study. Primary Research data is defined as new research data that has been created by the researcher for the specifics needs of their study. The advantages of having such data are clear in that it is highly relevant to the needs of the study and addresses a gap in the research area that another data is not available to address.

7.5 Future Challenges

A wide range of EHR systems is being developed and improved everyday also other forms of health care information technology is being implemented in the health care organization, it is essential for the administration need to have a thorough evaluation before implementation and end user acceptance, including profound preparation of the nurses by having education session prior to the introduction of EHR. It is fundamental that health care administrations are able to identify and manage elements of EHR that are critical to enhance time management of documentations by the health care staff. On the basis of this review its obvious that studies focusing on EHR issue should thoroughly done and further interventions are needed to help educate healthcare providers to determine on how to facilitate portal implantation into their practice when adopting EHR, Future research is required to explain whether the capacity of EHR to improve overall care delivery process of patients will likely outweigh the barrier associated with the additional time and cost required to use the system.

References

Ambinder Edward P. Electronic Health Records. Journal of Oncology Practice 1.2 (2005): 57–63.

Ammenwerth, Elske, Elske Ammenwerth, Carola Iller, and Ronald Eichstädter. Factors affecting and affected by user acceptance of computer-based nursing documentation: Journal of the American Medical Informatics Association 10.1 (2003): 69-84.

Arevalo, Jennifer Decker. Efficiency in Nurse Staffing Practices. Nursing News: AMN Healthcare, Inc. 2005. Sep. 2015.

Bowman Sue. Impact of Electronic Health Record Systems on Information Integrity: Quality and Safety Implications. Perspectives in Health Information Management 10.Fall (2013): 1-19

Burkes, M. Identifying and relating nurses' attitudes toward computer use. Computers in Nursing, 9.5 (1991): 190-200.

Burnie, Jeannie D. Electronic Health Records Documentation in Nursing: Nurses' Perceptions, Attitudes and Preferences. Master Research Proposal: Ball State University Muncie, Indiana. (2010) 1-45

Campbell, Emily M. Hong Li, Tomi Mori, Patricia Osterweil, and Jeanne-Marie Guise. The Impact of Health Information Technology on Work Process and Patient Care in Labor and Delivery. The Agency for Healthcare Research and Quality (AHRQ), No. HS015321. (N.d): 1-13

Carroll S.J, Williams M, Gallivan M. T The ins and outs of change of shift handoffs between nurses: a communication challenge. Published in: BMJ quality & safety 2012, Vol.21(7), pp.586-93

Dobrev A, Haesner M, Husing T, Korte W B, Meyer I. (2008) Benchmarking ICT use among General Practitioners in Europe. EU Information Society and Media Directorate General- Bonn (2008) 1-116)

Jha, Ashish K., Catherine M. DesRoches, Eric G. Campbell, Karen Donelan, Sowmya R. Rao, Timothy G. Ferris, Alexandra Shields, Sara Rosenbaum, and David Blumenthal. Use of electronic health records in the U.S. hospitals. The New England Journal of Medicine, 360.16 (2009): 1628-38

Lavin, Mary Ann., Ellen Harper and Nancy Barr. Health Information Technology, Patient Safety, and Professional Nursing Care Documentation in Acute Care Settings. OJIN: The Online Journal of Issues in Nursing 20.2 (2015).

Lee, Ting T. Nurses' perceptions of their documentation experiences in a computerized nursing care planning system. Journal of Clinical Nursing, 15, (2006): 1376-1382.

Lorenzi N.M, A. Kouroublai, D.E. Detmer & M.Bloomrosen How to successfully select and implement electronic health records (EHR) in small abulatory practice settings, BMC Medical Informatics and Decision Making, 2009, Vol.9, p.15-15

Menachemi, Nir and Taleah H Collum. Benefits and drawbacks of electronic health record systems. Risk Management and Healthcare Policy 4 (2011): 47–55

Miller, Leslie A., Michelle E. Stimely, Pamela M. Matheny, Melody F. Pope, Robin E. McAtee and Kia A. Mille. Novice Nurse Preparedness to Effectively Use Electronic Health Records in Acute Care Settings: Critical Informatics Knowledge and Skill Gaps. Online Journal of Nursing Informatics (OJNI), 18.2 (2014).

O'Connor A.M. Anderson K.M, Goodell C.K, Sargeant J.M, Writing the Reiew Protocol, Forumilating the Question and Searching the Literature (2013) 28-38

Persell SD1, Kaiser D, Dolan NC, Andrews B, Levi S, Khandekar J, Gavagan T, Thompson JA, Friesema EM, Baker DW. Changes in performance after implementation of a multifaceted electronic-health-record-based quality improvement system. Medical care, Vol.49(2), pp.117-25 (2011)

Pierpont, G L, Thilgen, D, Effect of computerized charting on nursing activity in intensive care, Critical care medicine 1995, Vol.23(6), pp.1067-73

Poissant, Lise, Jennifer Pereira, Robyn Tamblyn and Yuko Kawasumi. The Impact of Electronic Health Records on Time Efficiency of Physicians and Nurses: A Systematic Review. Journal of the American Medical Informatics Association, 12.5 (2005): 505-516.

Powell-Cope G, Nelson AL, Patterson ES. Patient Care Technology and Safety. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008 Apr. Chapter 50. Available from: http://www.ncbi.nlm.nih.gov/books/NBK2686/

Santos, Cristina Mamédio da Costa, Cibele Andrucioli de Mattos Pimenta and Moacyr Roberto Cuce Nobre. Nobre MRC. The PICO strategy for the research question construction and evidence search. Rev Latino-am Enfermagem 2007 maio-junho, 15.3 (2007): 508-11

Silow-Carroll S, Edwards J.N, Rodin D, Using Electronic Health Records to Improve Quality and Efficiency: The Experiences of Leading Hospitals Issue brief (Commonwealth Fund), Vol.17, pp.1-40 (2012)

Snyder, E. & Oliver, J. Evidence based strategies for attesting to Meaningful Use of electronic health records, Online Journal of Nursing Informatics (OJN) (2014 18,3)

Thabane L, Thomas T, Ye C, Paul J. Posing the research question: Not so simple. Can J Anaesth. 2009;56:71–9.

The National Academies: Networking Health prescriptions for the internet (2000) Accessed 12 February 2015. http://www.nap.edu/read/9750/chapter/1

Wakefield A. Searching and Critiquing the research literature. Nursing Standard 28, 39, 49-57 (2014)

Whitbeck Caroline Truth and Trustworthiness in Research, Science and Engineering Ethics 1, (1995) 403-416

Appendices:

Appendix 1:

Source	Problem	Purpose Research Question	Framework	Sample	Design	Instruments	Results
Burkes (1991)	Evaluating nurses' attitudes regarding computer use can help predict reactions to computerized documentation systems.	Measure nurses' computer use attitudes and identify variables that relate to these attitudes.	Vroom's expectancy theory	133 full and part time intensive care nurses	Descriptive Correlational quantitative survey	Investigator developed Knowledge, Satisfaction and Motivation Survey.	Nurses' satisfaction, beliefs and motivational attitudes were related. Age did not correlate with any variable in the study.
Ammenwerth et al. (2003)	Documentation of the nursing process is often	Evaluate preconditions, and	Lewins' field theory and Davis'	31 nurses on four units of a	Descriptive quantitative /	Investigator developed questionnaire using	Computer knowledge and previous acceptance of nursing process are

	neglected in documentation. Can computer based documentation systems improve documentation of nursing process	consequences to computer based nursing process documentation with an emphasis on acceptance.	technology acceptance model.	hospital	Qualitative-grounded	previously validated questions. Open focus group interviews by external researchers	significant predictors of acceptance. Task requirements and functionality of the system are important factors in user
Lee (2006)	Does the content of a computerized nursing care plan affect nurses' attitude and perception towards documentation	Explore how the content of a clinical nursing care plan influences nurses' perception of the documentation process.	Concept: Research evaluating nurses' experiences using computerized care planning systems has found that	20 purposively recruited nurses	Descriptive, exploratory, qualitative interviews	One on one Investigator developed interview	Three perceptions were identified: The content on the computer was used as a reference, as a learning tool and a way to apply personal judgment to modify the care plan.

			nurses value efficient caring planning, and minimizing paper printouts.				
Arevalo (2005)	Nurse Staffing Practices is a cause of inefficiencies	Explore how EHRs systems combine with correct staffing practices improve efficiency	Managing Unnecessary Variability in Patient Demand to Reduce Nursing Stress and Improve Patient Safety.				improving patient outcomes and overall satisfaction.”
Bowman	What is the	Measure nurses	Nursing				EHR systems promises a

(2013)	influence of Electronic Health Record Systems on Information Integrity: Quality and Safety Implications	impacts on Electronic Health Record Systems on Information Integrity: Quality and Safety Implications	efforts to reduce Stress and Improve Patient Safety.				number of considerable benefits, including improved care and reduced healthcare costs
Poissant et al. (2005)	EHRs have impacts on nurses and physicians effectiveness.	A systematic review of the literature was performed to examine the impact of electronic health records (EHRs) on nurses and physicians	A weighted average approach	23 papers met our inclusion criteria;	five were randomized controlled trials, six were posttest control studies, and 12 were one-group pretest-posttest	Literature review	EHRs impacts documentation time for the two key user groups, physicians and nurses.

					designs		

Appendix 2: Acronyms

ADL	Activity Of Daily Living
ANA	American Nurses Association
ARPN	Advance Registered Practice Nurse
CDS	Clinical Decision Support
CPOE	Computerized Physician Order Entry
EBP	Evidence Based Practice
EHR	Electronic Health Records
HIE	Health Information Exchange
HIT	Health Information Technology
ICU	Intensive Care Unit
IOM	Institute Of Medicine
IT	Information Technology
Mesh	Medical Subject Headings
NPC	Nursing Practice Committee
PDA	Personal Digital Assistant
PICO	Patient Intervention Comparison Outcome