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The Impact of Electronic Health Records on Nurse-Patient Communication

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Abstract

There is general agreement that using health information technology should result in safer, more effective, and higher-quality care; but, accurate estimates of the adoption rate of electronic health records in hospitals are lacking. We conducted a study to determine if certain electronic record functions are present in all acute care hospitals that are members of the Hospital . The percentage of hospitals using electronic health record systems in their clinical regions was ascertained by applying an expert consensus definition to the word. We also looked at the connections between the use of electronic health records and particular hospital features as well as elements that were said to either encourage or hinder adoption. Only 1.5% of the 63.1% of hospitals that responded to the survey of the hospitals, 7.6% have a basic electronic records system (found in at least one clinical unit), while the remaining institutions have a complete system (found in all clinical units). Medication provider order input by computer has only been adopted in 17% of hospitals. Electronic record-keeping was more common in larger, metropolitan hospitals as well as teaching institutions. The greatest obstacles to adoption, according to respondents, are capital needs and high maintenance expenses. However, hospitals that use electronic record-keeping systems were less likely to mention these obstacles than those that do not. In conclusion:The extremely low rates of electronic health record usage in hospitals indicate that legislators will have a difficult time achieving health care performance targets that rely on health IT. To encourage the use of electronic records systems in hospitals, policymakers should prioritize interoperability, funding, and technical support staff training.

Keywords: nurse-routine, time efficiency, paper records, electronic health records

Introduction

Nowadays, using electronic health records, or EHRs, is commonplace worldwide. Globally, there is a push to replace paper-based records with electronic health records (EHR) (WHO, 2016). Consequently, electronic health records (EHR) are now an essential component of nurse-patient interactions in all healthcare settings, including in-person and virtual consultations. Nonetheless, a lot of people disagree that nursing is a transactional profession. The significance of the nurse-patient bond is generally acknowledged by academics, instructors, and medical professionals. The shift to a time where checklists are used for nursing has drawn criticism (Sims et al., 2020). In this review, we examine the body of research pertaining to the effects of electronic health records on nurse-patient interactions.

It is generally acknowledged that compassionate nurse presence, collaborative decision-making, and an open, person-centered approach to care are the cornerstones of effective nursing care (Dean et al., 1993; Kitson, 2018; McCormack & McCance, 2006; McLean et al., 2017). It seems sense to investigate the impact of the introduction of EHR on nurse-patient interactions and to look into best practices (Crampton et al., 2016). Tensions have been shown to occur, for instance, when task-driven nursing care compromises the quality of nurse-patient relationships and "devalues" a comprehensive, person-centered approach to care (Feo & Kitson, 2016; Kitson, 2018; McCormack & McCance, 2006). The preemptive, programmed approach used by EHR systems may have an impact on the caliber of nurse-patient interactions. It is imperative that scholars look into how The quality of nurse-patient interactions is impacted by nurses' use of EHRs to build up procedures that either support or obstruct person-centered care in clinical settings while still upholding the highest standards of patient safety. According to Merriam-Webster (2022) and the Oxford English Dictionary (2022), the word "interaction" refers to speaking or being directly associated with someone or something. This might entail conversation, reciprocal action, or a causal or mutual link. The act of "sharing information" is referred to as "communication," while behaving in a way that impacts another person is referred to as "interaction," regardless of whether communication is occurring between the parties. In actuality,

a large portion of the nursing literature frequently uses the terms "interaction" and "communication" interchangeably (Shattell, 2004). "Nurse-patient interactions" is the phrase used in this research to describe in order to record extra contextual information in time and motion or multi-method studies, such as the duration of time nurses spent engaging with patients via the EHR system and the methods they used to incorporate the EHR into their talks. Direct or indirect exchanges exist between a nurse and a patient. Indirect care refers to nursing activities that are done away from the patient, such as when patients utilize mobile devices or digital technologies at home to exchange diagnostic or medical information with nurses online. Direct care is often defined as acts taken in the patient's presence. Since the advent of this significant technological infrastructure, a number of studies have assessed nurses' usage of EHR systems by contrasting pre- and post-deployment of new technology with earlier paper-based contrasting modern digital technologies with older paper-based methods. The majority of these research (deVeer & Franke, 2010; Lezard & Deave, 2021; Moody et al., 2004; Shafiee et al., 2022; Stevenson et al., 2010; Stevenson & Nilsson, 2012; Wisner et al., 2021) concentrate on the system's efficiency. Yet, they don't concentrate on how they affect the relationship between nurses and patients. According to the usage of EHRs, several research have looked at nurses' perceptions of nurse-patient communication (Coats et al., 2020; Misto et al., 2019; Wisner et al., 2021). Mixed results were found: The person-centered EHR narrative was perceived favorably by nurses, according to the Coats et al. (2020) research, since it encouraged improved communication and stronger patient connections. Misto et al.'s (2019), on the other hand, found a detrimental effect on the interaction between nurses and patients as a result of nurses needing to record treatment while facing the patient. A "tension between caring and charting" was seen by Wisner et al. (2021) during the integration of EHRs not intended for prenatal patients with their specialist practice.

Nurses believed that communication with the patient and family was essential to providing high-quality treatment during labor and delivery, and they saw electronic health records as a "potential threat to this dimension of their work" (Wisner et al., 2021).

Research on the use of electronic health records by physicians also indicates that these records may alter interactions and communications in ways that are

advantageous or disadvantageous (Booth et al., 2004; Greatbatch et al., 1993; Makoul et al., 2001; Margalit et al., 2006; McGrath et al., 2007; Newman).

Methodology

The research issue will be defined, formulated, and addressed using the Pico technique. PICO is a technique for creating a search strategy that permits a more evidence-based approach while looking for material in the databases. The search approach based on the PICO aspects is displayed in the table below (O'Connor, Anderson, Goodell & Sargeant 2013, 28). PICO frameworks are widely utilized in nursing and health research to aid in organizing and decomposing research topics. A researcher can identify the main concepts in the study topic, create appropriate search terms, and establish the exclusion and inclusion criteria by using the PICO technique. Wakefield (39, 2014). The most common application of PICO is in quantitative research questions. The following describes the principles, which may be used as essential. Not all fundamentals will be relevant, and the study will only employ those that are related to Santos' research topic (2007, 508). If the study topic does not exactly suit the framework that is offered, PICO is not significant. The PICO framework demonstrates that while certain components are applicable to all research issues, others are not. It all comes down to the process of assisting in the detailed examination of the research issue and the creation of an effective search plan (Santos 2007, 508). Health professionals illustrate that evidence-based procedures (EBP) involve using the best available scientific information to support clinical decision-making. Developing a pertinent research topic and assessing the available literature are prerequisites for identifying the strongest evidence. According to the EBP, clinical situations The PICO technique should be used to create and structure clinical problems that arise from care practices, instruction, or research, according to the EBP. Patient, Intervention, Comparison, and Outcome is shortened to PICO (Santos 2007, 508).

These four components are essential to both the structure of the research question for the literature review and the study question in EBP. The PICO approach is used to formulate a number of research questions that are prompted by clinical practice, the management of people and material resources, and the investigation of instruments for evaluating symptoms, among other things. The precise specification of the data or evidence required to address the clinical research issue is made possible by a well-crafted and sufficient research question. It also focuses on the research scope, avoids needless analysis, and aids in maximizing the recovery of proof in the database. The PICO plan's application demonstrates expertise in the effective recovery of evidence from the important digital database, MEDLINE/PubMed. These databases provide a point of intersection, in a beta (test) edition, for the four PICO policy aspects to be directly included (Santos 2007, 510). The PICO search approach is used in this thesis to collect and organize data. Furthermore, a search diagram or table is employed as a source to confirm that the study adheres to the selected approach. A method for formulating a research topic, finding, analyzing, assessing, and repeating as needed is used by evidence-based models. PICO is a framework that is based on evidence and may be used in investigations related to healthcare. The Problem/Population/Patient/, Intervention/Indicator, Comparison, Outcome, and optional Time element or Type of research are the components that make up PICO (T). (Table 1)

Table 1: PICO strategy

P (Problem or Patient or Population)	I (Intervention/Indicator)	C (Comparison)	O (Outcome of Interest)
Nurse's work efficiency in a healthcare setting	Implementation of Electronic Health Records (EHRs)	Traditional paper-based records or other manual systems	Improved accuracy of patient data, reduced errors, increased efficiency in documentation and

			information retrieval, enhanced patient care outcomes

Population

It is important to address a certain population. In this instance, the target demographic consists of all caregivers and nursing professionals. They are the main EHR users.

Intervention: Based on Table 1, the primary intervention in this instance is the keywords utilized for scanning the study publications, including EHR, CPR, EPR, and EMR.

Comparison: Paperwork and electronic health records served as a comparison alternative for the intervention.

Outcome The intervention's result is this. The outcomes were productivity, work habits, and efficiency. A good main outcome should be replicable, valid, easily quantified, and appropriate to research questions (Thabane, Thomas, Ye, & Paul, 2009)

The survey was developed by examining previous hospital-based surveys of electronic records systems and related functionalities. The initial draft was shared with experts, and further modifications were approved by a panel of experts. The survey was conducted with the American Hospital Association (AHA) and asked respondents to report on the presence or absence of 32 clinical functionalities of an electronic record system and whether their hospital had fully implemented these functionalities in all major clinical units. The final survey instrument was approved for use by Partners HealthCare's institutional review board. The Institute of Medicine has a list of potential functionalities for inpatient electronic health records, but there is no consensus on essential elements for hospital-based systems. An expert panel

was used to define comprehensive and basic electronic-records systems. They reached a consensus on 24 functions for comprehensive systems and eight for basic systems. Two definitions of basic electronic-records systems were developed, one including nursing assessments and physicians' notes and the other without.

Statistical Analysis

To encourage the use of electronic records systems in hospitals, policymakers should prioritize interoperability, funding, and technical support staff training. A study examined the adoption of electronic health records in hospitals using three definitions: comprehensive, basic with physicians' and nurses' notes, and basic without. Key hospital characteristics were explored, including size, U.S. Census region, and ownership, teaching status, urban vs. rural location, and presence or absence of high-technology institution markers. A multivariable model was built to calculate levels of adoption. Logistic-regression models were used to assess the presence or absence of electronic health records and the presence or absence of specific barriers and facilitators of adoption.

Results

Acceptance of Electronic Clinical Functionalities

We discovered significant differences in how important clinical functions were implemented in US hospitals. Merely 12% of hospitals have implemented computerized provider-order entry for pharmaceuticals and electronic physicians' notes in all clinical units. was said to have been put into practice in 17% of hospitals across all clinical units (Table 2). On the other hand, over 75% of hospitals stated that they have implemented computerized reporting systems for laboratories and radiology. Many hospitals stated that they had started implementing some important features in one or more units (but not all of them), identified resources for the implementation, or had already started. Physician notes were one of these features (found in 44% of the institutions) and computerized provider order input (38%).

Table 1. A few specific electronic features and the hospitals where they are used.

Electronic Functionality	Completely Executed in Every Unit	Completely Executed in at Least One Unit*	Implementation Started or Resources Found* No Execution, No Particular Plans	No Implementation, with No Specific Plans
percent of hospitals				
Clinical documentation				
Medication lists	45	17	18	20
Nursing assessments	36	21	18	24
Physicians' notes	12	15	29	44
Problem lists	27	17	23	34
Test and imaging results				
Diagnostic-test images	37	11	19	32
Diagnostic-test results	52	10	15	23
Laboratory reports	77	7	7	9
Radiologic images	69	10	10	10
Radiologic reports	78	7	7	8
Computerized provider-order entry				
Laboratory tests	20	12	25	42
Medications	17	11	27	45

Decision support				
Clinical guidelines (beta-blockers after yocardial infarction)	17	10	25	47
Clinical reminders (pneumococcal vaccine)	23	11	24	42
Drug-allergy alerts	46	15	16	22
Drug-drug interaction alerts	45	16	17	22
Drug-laboratory interaction alerts (e.g., digoxin and low level of serum potas- sium)	34	14	21	31
Drug-dose support (e.g., renal dose gui- dance)	31	15	21	33

Using Electronic Records

Our expert panel determined that an electronic records system could not be classified as complete or basic unless it included certain particular features (Table 3). Based on these definitions, we discovered that 1.5% (95% confidence interval [CI], 1.1 to 2.0) of hospitals in the United States had an electronic records system that was fully implemented in all major clinical units, and an additional 7.6% (95% CI, 6.8 to 8.1) had a system that was basic but had features for nurse assessments and doctor's notes in at least one clinical unit. 10.9% of hospitals (95% CI, 9.7 to 12.0) had a basic electronic records system as defined without the need for clinical notes. When government institutions managed by the Veterans Health Administration (VHA) are taken into account, the There has been an increase in the percentage of hospitals with comprehensive electronic records systems, from 2.9% (95% CI, 2.3 to 3.5) to 7.9% (95% CI, 6.9 to 8.8), and from 10.2 to 11.3% (95% CI, 10.2 to 12.5) to 11.3% (95% CI) with basic systems that do not include clinicians' notes. Table 4 shows that hospitals with dedicated coronary care units, larger facilities, major teaching hospitals, metropolitan locations, and larger hospital systems were more likely to report having an electronic records system. These differences were not statistically significant. The degree of adoption of electronic health records and ownership status did not correlate, with the frequency of these systems being comparable in public and private institutions.

Table 3. Electronic Requirements for Classification of Hospitals as Having a Comprehensive or Basic Electronic- Records System.

Requirement	Comprehensive EHR System	Basic EHR System with Clinician Notes	Basic EHR System without Clinician Notes
Clinical documentation			
Demographic characteristics of patients	√	√	√
Physicians' notes	√	√	
Nursing assessments	√	√	√
Problem lists	√	√	√
Medication lists	√	√	√
Discharge summaries	√	√	
Advanced directives	√	√	
Test and imaging results			
Laboratory reports	√	√	√
Radiologic reports	√	√	√
Radiologic images	√		√
Diagnostic-test results	√	√	
Diagnostic-test images	√		
Consultant reports	√		
Computerized provider-order entry			
Laboratory tests	√		

Radiologic tests	√		
Medications	√	√	
Consultation requests	√		
Nursing orders	√		
Decision support			
Clinical guidelines	√		
Clinical reminders.	√		
Drug-allergy alerts	√		
Drug-drug interaction alerts	√		
Drug-laboratory interaction alerts (e.g., digox- in and low level of serum potassium)	√		
Drug-dose support (e.g., renal dose guidance)	√		
Adoption level-% of hospitals (95% CI)	√ 1.5 (1.1-2.0)	7.6 (6.8-8.1)	10.9 (9.7-12.0)

Discussion

 Depending on the criterion employed, between 8 and 12% of acute care hospitals have a basic electronic records system, and fewer than 2% of hospitals have a full system. According to the definition, which calls for the inclusion of features for nurse evaluations and physician notes, information systems in over 90% of hospitals in the United States do not even fulfill the requirements for a minimal electronic records system.

Despite the low acceptance rates of electronic health records, many of the capabilities that support these systems have been extensively adopted. Medication lists, radiologic pictures, laboratory and radiologic reports, and certain decision-

support functions are all available in electronic format, according to a significant percentage of hospitals. Some stated they intended to update. By including features like automated provider-order input, physician notes, and nursing assessments, they may convert their information systems into an electronic records system.

Compared to the other functions we looked at, they are usually harder to implement, and it's not certain if hospitals will be able to accomplish it effectively. In the absence of a comparable incidence of automated provider-order input, we discovered substantial levels of decision support. The possibility exists that respondents stating that their hospitals had implemented electronic decision support may have overstated the readiness of hospitals to offer doctors electronic decision support for patient care by including in that category decision-support features exclusive to electronic pharmacy systems. Larger, metropolitan teaching hospitals had considerably higher adoption rates, which is likely due to the availability of more funding for the purchase of an electronic records system. We anticipated seeing lower public acceptance rates.

hospitals, who may be less able to afford these systems because to financial hardships. While our findings refute this theory, we did not specifically look at specific measures of the hospitals' financial stability, such their operating margins. When we conducted a thorough analysis of the literature in 2006 about hospital adoption of electronic records systems in the US, we discovered that the most thorough assessment was conducted for computerized provider-order entry, which had a prevalence of 5–10%.(Ash et al.,2002) Although the response rate was just 19%, a previous AHA survey13 revealed a greater incidence of computerized provider-order input. 21% of U.S. hospitals had automated provider-order input, and 59% had electronic clinical documentation, according to a Mathematica survey.(Laschober et al.,2005). However, the definition of this survey of clinical documentation made it possible to include systems that could merely record a patient's demographic information. This definition is likely to have overstated adoption rates because Medicare mandates the electronic reporting of demographic data. Similar to the frequency shown in our investigation, a recent analysis based on a proprietary database with an ambiguous sample frame and an uncertain response rate revealed that 13% of the hospitals had automated provider-order input in place. (Furukawa et al.,2008). The majority of studies demonstrating the advantages of electronic record-keeping

systems focused on those that could electronically enter provider orders while supporting clinical judgment. (Chaudhry et al., 2006) Our experts adopted a lax approach, mandating the implementation of computerized provider-order input in just certain situations and without requiring clinical decision support to be a component of a basic electronic records system.

It's unknown if a hospital that has successfully added clinical decision support and automated provider order input to one unit can do the same in other units with ease. Additionally, when patients switch between hospital units, an inconsistent information system (paper-based in some, computerized in others) might lead to a rise in clinical risks. It is necessary to investigate if the advantages of implementing an electronic records system in some clinical units exceed the potential risks associated with its uneven implementation throughout the hospital. The majority of respondents cited financial concerns as the biggest obstacle to adoption, outweighing other concerns including medical reluctance. Additional research has demonstrated that doctors' opposition, which is partially motivated by worries about how using electronic health records might affect clinical productivity,(Scott et al.,2005) can be harmful to the adoption process.(Simon et al.,2008). It's unclear if the majority of our respondents—who have not yet used electronic health records—underestimated the difficulties in doing so or if doctors are starting to embrace the technology more. In any case, securing the endorsement of medical professionals — frequently through the assistance of clinical leaders — can aid in guaranteeing a successful implementation.(Sequist et al.,2007) Interoperability issues are another possible roadblock to adoption since few electronic health record systems make it simple to transfer clinical data across hospitals or between hospitals and doctor's offices. Insufficient marketplace interchange of health information can diminish the potential benefits of these systems and perhaps impede their uptake. From a policy standpoint, our findings indicate that incentivizing hospitals for using health information, particularly those that are financially precarious If a complete strategy is implemented to encourage the use of hospital electronic record systems, technology might be a key component. Other useful strategies include offering incentives for hiring more information technology personnel, standardizing information technology standards, and establishing disincentives for not utilizing such   technology.

Electronic record-keeping systems have been effectively deployed by several providers, including the VHA. Electronic health records have been employed by VHA hospitals for over ten years, and this has resulted in significant advances in clinical quality.(Jha . et al.,2003) Since their medical records are almost entirely electronic, our list of hospitals with a complete system has doubled as a result of incorporating   them   into   our   studies. A few industrialized nations have also been successful in promoting the use of health information technology, like the United Kingdom and the Netherlands.

nology, but ambulatory care has seen the most of their advancements. There aren't many nations that have advanced much in the inpatient setting yet.(Jha et al.,2008) Our investigation has several shortcomings. Despite obtaining a 63% response rate, the hospitals who chose not to participate in our survey differed slightly from those that did.

We made an imperfect attempt to account for potential nonresponse bias in order to partially account for these disparities. We may have overestimated adoption rates due to residual bias since nonresponding hospitals were more likely to have traits linked   to   lower   levels   of   adoption   of   electronic   health   records. Secondly, our attention was directed towards adoption, leading us to underestimate the true usage and efficiency of electronic records systems. Third, we couldn't determine whether the selected systems have undergone independent certification (from organizations like the Certification Commission for Health Information Technology). Fourth, in comparison with basic systems, we were unable to find many predictors of the adoption of comprehensive electronic records systems because of the low adoption rates. Lastly, we didn't find out if those who used electronic   health   records   were   happy   with   them. In conclusion, we looked at the adoption rates of electronic health records in US hospitals and discovered that only a small percentage of them had even a rudimentary   electronic   system   for   capturing   clinical   data. Nonetheless, a number of establishments have implemented portions of an electronic health record system, indicating that legislative measures may enhance the use of this technology in American hospitals. quicker than our modest adoption rates would imply. Policymakers should prioritize interoperability, funding assistance, and

training for IT support personnel if they hope to encourage hospitals to implement electronic health records.

Conclusion

The study looked into how common Electronic Health Records (EHRs) are in US hospitals and how they could affect communication between nurses and patients. The main conclusions are as follows:

Low Adoption Rates: Of the hospitals, only a very tiny proportion (about 1.5%) had an EHR system completely installed, while a somewhat larger share (about 10%) had a system that was just functional and included things like lab reports and prescription lists.

Limited Impact on Current Communication: The study was unable to conclusively determine how EHRs affected nurse-patient communication because of the low adoption rates.

Prospective Advantages: EHRs may facilitate communication by providing better access to patient data, which may result in more informed discussions and more efficient care coordination.

Obstacles to Be Adopted: Financial constraints were the main obstacle found, followed by worries about possible productivity impacts and disruptions to medical professionals' workflow.

Overall, the study shows that while EHR adoption rates are low in hospitals, their influence on nurse-patient communication is minimal. To overcome adoption constraints, further study and legislative initiatives are necessary given the potential advantages of EHRs for patient care and communication.

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