Fall 11-30-2016

Effects of Electronic Health Record Use on the Ambulatory Surgical Services Nurse's Time

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EFFECTS OF ELECTRONIC HEALTH RECORD USE ON THE AMBULATORY SURGICAL SERVICES NURSE'S TIME

By

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A Thesis

Presented in Partial Fulfillment of Requirements for the

Degree of

Master's in Nursing Science

In the

WellStar College of Health and Human Services

Kennesaw State University

Kennesaw, GA

2016

ACKNOWLEDGEMENTS

A process as daunting as writing a thesis could never be accomplished without the assistance, guidance, and encouragement of many people. This author is very grateful to God Almighty for His graces and blessings in being there to guide me through another journey in life.

I would like to express sincere appreciation to my thesis committee chair, Dr. Doreen Wagner for her assistance throughout this process. She has kept me focused and on task. I could not have achieved the completion of this process without her expertise and guidance. In addition, I would like to thank Dr. Nancy Ballard, my thesis committee co-chair, who offered concise editorial comments and was readily available. My gratitude to you both is enormous.

Next, I would like to express sincere appreciation to my other mentors, Dr. Patricia Hart and Dr. Janice Long, who were always available and ready to offer their assistance. Both of them are incredible nurses and inspiring professors. Thanks to Dr. VanBrackle for guiding me through the quantitative process with his statistical expertise and the time he devoted to support my research. To my fellow graduate students, especially Tricia Shropshire, thank you for always stimulating me intellectually and supporting me through this journey.

Lastly, I would like to thank my family and friends. My husband, Jon Taylor is always my rock and has offered love, patience, encouragement, and support to me along the way. He maintained a sense of balance in our lives during this process and has championed me forward to completion. Without his love and support, none of this would have been possible. My children, Anson, Abbi, and Aiden Taylor have endured the past year of education with me. Their sense of humor has helped to lighten the stress of obtaining my Master of Science in Nursing. Thank you to all of my friends and co-workers in helping me to

further my education. Your support, encouragement, and insistence on doing my school work has gotten me to graduation.

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ABSTRACT

Purpose: The purpose of this study was to determine the length of time the ambulatory surgical services nurse spends on the EHR compared to performing hands-on patient care.

Design: The research design used in this study was a non-experimental descriptive design.

Methods: Twenty-two surgical services nurses at a small not-for-profit hospital located in the southeastern United States were invited to participate in the study. Out of the 16 ambulatory surgical services nurses that completed the study, one participant was omitted due to incompleteness resulting in a total of 15 time-studies that were used for the data analysis, resulting in a usable return rate of 94%.

Data Analysis: Descriptive statistics were performed to describe the amount of time the ambulatory surgical services nurse spent on the computer and to describe the amount of time the ambulatory surgical services nurse spent performing hands-on patient care. Independent t-tests were used to compare the differences in the two variables of interest (time spent on the EHR and time spent on hands-on care) with an alpha of 0.05 considered statistically significant.

Discussion of Findings: The ambulatory surgical services nurses spent an average of 16.3% of a ten-hour shift working on a computer as compared to 9.1% of their time performing hands-on care in the same shift. The amount of time spent performing hands-on care is significantly ($p = 0.001$) different than the amount of time spent on the EHR.

Clinical Relevance: Further exploration of nurses' time spent on the EHR is needed to gain further insight into the differences in time of EHR usage by the ambulatory surgical services nurse as compared to hands-on care provided.

Keywords: electronic health record, computer documentation, time efficiency, nursing documentation, surgical services nurse documentation, and health information technology

CHAPTER 1: INTRODUCTION

Florence Nightingale realized the importance of formal nursing documentation, in order to facilitate clear and thorough nursing communication between and among caregivers (Selanders & Crane, 2012). Today's electronic health record (EHR) should help to facilitate this communication. The EHR has been deployed within health care organizations to improve the quality, safety, and efficiency of care when fully implemented. The use of the EHR can improve communication among health care providers and increase team effort among providers (Ritchie, 2013). However, to achieve these goals, the EHR must be used by all staff and clinicians, and this remains a major challenge. Various positive factors appear to be associated with the EHR use. They can decrease the amount of time it takes to obtain patient information if utilized properly (Thompson et al., 2010). Negative factors associated with the EHR all focus on increased time to do charting (Poissant et al., 2015).

The United States (US) government has created financial incentives for healthcare organizations and eligible professionals to use EHR systems in a manner that meets the Centers for Medicare & Medicaid Services (CMS) defined criteria for "meaningful use" (Hummel & Evans, 2012). Experiences of larger healthcare delivery systems that have implemented the EHRs indicate a variety of pitfalls associated with the Information Technology (IT) adoption that may contribute to financial loss and care disruption impacting patient care (Fleming et al., 2011).

EHR systems are built to help physician and healthcare teams improve their patient care. But EHRs may also come between the caregiver and the patient during an encounter. Many health care professionals believe they spend more time typing into a computer instead of looking their patients in the eye (Hertz, 2014). The ambulatory surgical services nurse has a limited time frame to get a patient ready for their procedure and they are among the health care professionals

discussed by Silow-Carroll, Edwards, & Rodin (2012) that feel that they are using the EHR more than actually taking care of their patients.

This chapter presents the purpose of the study, background and significance, problem statement, and the theoretical framework that guides this study. Research questions, definitions, assumptions, and limitations will be included in this chapter.

Purpose

The purpose of this study was to determine the length of time the ambulatory surgical services nurse spends on the EHR compared to performing hands-on patient care. The study also examined how the EHR affects the ambulatory surgical services nurse's time on an average day in the outpatient surgery setting.

Statement of the Problem

Implementation of the EHR into healthcare organizations has drastically changed the workflow for staff. The challenge faced by the nursing profession has been to obtain electronic applications that provide clinicians with a framework for EHR documentation consistent with the complexity of nursing practice and the time allowance needed to complete the documentation (Schwiran & Thede, 2011). Healthcare professional must meet the required documentation standards set forth by CMS guidelines and still remain personable and engaged with patients to provide hands-on patient care. The time needed to complete these standards is significantly reduced in the ambulatory surgery setting for ambulatory surgical services nurses. Detailed documentation is important within the day surgery environment but is often condensed to just a few hours. All aspects of treatment and care must be recorded and meet regulatory guidelines (Verma, et al., 2011). The time spent on the EHR by the ambulatory surgical services nurse needs to be evaluated to determine other opportunities for the nurses in this clinical setting to

remain personable and engaged with patients to provide hands-on patient care while still meeting EHR requirements and standards.

Background and Significance

Healthcare is undergoing many changes. Hospital systems are restructuring and merging with other systems (Kavanagh et al., 2012). In 2004 President George W. Bush launched an initiative to ensure that all patients in the US have an EHR by 2014. The shift from paper-based to computer-based has raised questions regarding the way nursing documentation is organized and presented in the EHR (Krogh, 2012). EHRs are improving patient care across the country, and we are on our way to a system that will allow doctors and hospitals nationwide to securely share and store patient records (Halamka, 2013). The US aims to achieve nationwide adoption of EHRs but lacks robust empirical evidence to anticipate the effect on health costs and use of time (Adler-Milstein et al., 2013). Successful implementation requires that end users understand each workflow, that all technology components work properly with the corresponding workflow and that each end user knows how to use the relevant software components (Hummel & Evans, 2012).

With the passing of the Patient Protections and Affordable Healthcare Act, electronic health records have been widely adopted across healthcare organizations. While there are many benefits to EHRs such as improved accessibility to patient data, increased charge capture, and improved preventative health there are inherent problems in adopting this technology (Palma, 2013). Therefore, research to determine the amount of time the nurse spends on the EHR in various clinical settings is needed. We must determine faster ways for nurses and other health care professionals to document when time constraints are placed on them. An EHR is only as good as the process it supports and if the technology is not supported with well thought out

processes, hospitals may invest in complicated and expensive technologies that create more waste in a system and healthcare professionals time than intended (Palma, 2013). The actual amount of time the ambulatory surgery nurse spends using the EHR was determined in this study. The study can benefit healthcare organizations by validating the time use of the EHR by nursing staff that have constricted time frames to complete documentation. Findings from this study could provide an impetus to identify ways to decrease time spent for EHR documentation.

Theoretical Framework

The Myra Estrin Levine Conservation Model (1973) will be used as the theoretical framework to guide this study. Levine based the Conservation Model on Nightingale's idea that "the nurse created an environment in which healing could occur" (McEwen & Wills, 2014, p. 237). The idea of conservation pervades the background of some nurses' ideas (Mefford, 2004). Myra Levine also stated that "nursing is a human interaction" (McEwen & Wills, 2014, p. 237). Her model deals with the interactions of nurse and client and it considers multiple factorial interactions, which may produce predictable effects using probability as the reality (McEwen & Wills, 2014).

There are four major conservation principles that construct the Levine model: conservation of energy, structural integrity, personal integrity, and social integrity. According to Levine's model, nursing interventions are based on conservation of the client's integrity in each of the conservation domains (Levine, 1973; 1990). Conservation of energy is based on nursing interventions to conserve energy through deliberate decisions to balance between activity and the person's available energy and in this case the amount of energy used to complete the EHR charting and the hands-on portion of the nurse's time. Structural integrity is the basis for nursing interventions to promote healing and in this study that would be the nurse completing all the

required documentation of the EHR and assisting the patient getting ready for surgery. Personal integrity is a person's sense of identity and self-definition. In this study, that principle would relate to the nurse establishing the role as the care giver while maintaining individual personal integrity, decision making and interactions with the EHR as part of caring for the patient. Social integrity is life's meaning gained through interactions with others. Nurse interactions with the patient and the patient's family and maintaining relationships are interpreted as the principle of social integrity in this study. Another important concept of the Conservation Model is holism and the fact that humans (patients) are holistic beings (McEwen & Wills, 2014). This concept relates to the nurse in the use of the EHR and hands-on care of patients. Levine (1973) considers all nursing interventions to be based on carful and continued observation over time. The interventions of EHR use and hands-on care by the ambulatory surgical nurse will be considered in this study.

Research Questions

The research questions guiding this study were:

1. What is the average amount of time the ambulatory surgical services nurse spends on the EHR when preparing an ambulatory surgical patient for surgery?
2. What is the average amount of time the ambulatory surgical services nurse spends performing hands-on care when preparing an ambulatory surgical patient for surgery?
3. What is the percentage of time the ambulatory surgical services nurse spends on the EHR on an average day compared to the percentage of time spent on hands-on care?

Conceptual Definitions

Electronic health record. Electronic health record (EHR) is the term that refers to the software that tracks all aspects of patient care, including billing, scheduling, and coding for patient care (Englebright, Aldrich, & Taylor, 2013).

Ambulatory surgical services nurse. An ambulatory care nurse is a specialty nurse that practices in a specialty area that is characterized by nurses responding rapidly to high volumes of patients in a short span of time while dealing with issues that are not always predictable. Ambulatory surgical services nurses take care of surgical patients who seek care for health promotion, health maintenance, or health-related problems and focus on cost-effective ways to maximize wellness, prevent illness, manage acute and chronic diseases to affect the most attainable positive health status over the patient's life span up to and including a peaceful death (AAACN/ANA, 2011).

Surgery. Surgery is the specialty of medicine that treats diseases and disorders by cutting, removing or changing the body with an operative procedure (Whitlock, 2014).

Hands-on care. The term most often means those services provided during face-to-face contact with the patient (ACA, 2015). Laying of hands on a patient, taking vitals, assessing patient from head to toe including listening to their heart, lungs, and abdomen to document the findings of all of these areas as well as the patient's status and needs, and administering medications.

Surgical nurse time. The time the nurse spends in protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations (ANA, 2015).

Assumptions

The assumptions in this study included: 1) the time the ambulatory surgical services nurse spends on the EHR will be more than the time he/she spends with hands-on patient care; 2) with increased training on the EHR and evaluation of the variables, determinations for improvement in time efficiencies can be made; 3) implementing a smoother process for the use of the EHR for the ambulatory surgery patient will increase satisfaction of the ambulatory surgical services nurse when using the EHR; and 4) perceptions will change and/or the amount of time spent on the EHR will decrease for the ambulatory surgical services nurse.

Limitations

A major limitation in this study included the exclusion of all other nursing departments in the hospital. Patients are in the ambulatory surgery department for a limited amount of time: therefore completing all requirements of the EHR can cause the ambulatory surgical services nurse to have time constraints. A single EHR system was studied, limiting the opportunity to identify problems in multiple systems.

Another limitation to this study was that only a single healthcare facility in the southeastern US was utilized. This limited the external validity. Studying multiple healthcare facilities could possibly further substantiate or negate the hypothesis. Collecting and comparing the same data from multiple healthcare facilities that use the EHR in the ambulatory surgical setting would improve the external validity of the findings. This was not possible with the resources and time constraints of the study.

The outpatient surgery department at the healthcare facility studied is only open during set business hours Monday through Friday. It is not open on holidays or weekends. The time

frame studied was June 1 – 4 of 2016. The restricted time frame limited the internal validity of the study.

CHAPTER 2: REVIEW OF THE LITERATURE

This chapter provides a review of literature that supports the purpose of this study. The literature focuses on the implementation of electronic documentation, the use of the EHR by nursing, and healthcare professionals' satisfaction with the EHR. The review will begin with a brief description of electronic documentation.

Electronic Health Record

An electronic health record (EHR) is an electronic version of a patient's medical history, that is maintained by the provider over time, and may include all of the key administrative clinical data relevant to that persons care under a particular provider, including demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports The EHR automates access to information and has the potential to streamline clinician workflow. The EHR also has the ability to support other care-related activities directly or indirectly through various interfaces, including evidence-based decision support, quality management, and outcomes reporting (CMS, 2014). EHRs are the next step in the continued progress of healthcare that can strengthen the relationship between patients and clinicians. The data, and the timeliness and availability of it, will enable providers to make better decisions and provide better care.

Implementation of Electronic Documentation

Several studies presented information about the implementation of electronic records and documentation (Blavin, 2013; Boonstra, 2014; Daskein, Moyle & Creedy, 2009). According to Blavin & Buntin (2013), to promote the widespread adoption and use of health IT, Congress passed the Health Information Technology for Economic and Clinical Health (HITECH) provisions of the American Recovery and Reinvestment Act (ARRA) of 2009, with the ultimate

aim of improving quality, safety, and efficiency of the US health care system. Through programs such as these and the Medicare and Medicaid EHR Incentive Programs, hospitals obtain the money they need to implement electronic documentation. An estimated $27 billion is made eligible to health professionals and hospitals to adopt, implement, or upgrade certified EHR technology and to achieve the Meaningful Use (MU) of health IT (Blavin & Buntin, 2013). This study provided the information that ARRA HITECH programs appear to be associated with the rise in the adoption of EHRs. In 2012, 16.9 percent of non-federal acute care hospitals reported having a comprehensive EHR system and 27.6 reported having a basic system, representing increases of 15 and 20 percentage points compared to 2008. Similarly, 39.6 percent of office-based physicians reported using an EHR that met the criteria of a basic system in 2012, more than twice the share of physicians with a basic system in 2008 (Blavin & Buntin, 2013). The Blavin study was based on the different stages of the EHR implementation process (planning and vendor selection, workflow and software design, training and user support, and optimization and modification) and explored each stage through multiple perspectives. Blavin & Buntin (2013) identified that the planning stage of EHR implementation is critical to whether or not implementation will ultimately be successful. The study also discussed the need for careful selection of the system that will meet the organization's needs, obtaining staff buy-in, defining an implementation strategy with a realistic time line and determining the speed or pace at which implementation will occur. Finding from the study indicated that it is important for organizations to consider not only their technical needs, but the perspectives of the staff from all levels of the organization and the organizational culture and environment in which the system will be implemented (Blavin & Buntin, 2013). Acquiring and implementing new technology requires lots of planning from start to finish. There are many pros and cons but a fact that must

be realized from the beginning is that systems must be designed for quality improvement and information exchange. A major consensus is that EHRs are not individually tailored and need to be continuously customized to improve usability and meet the need of the organization and staff (Blavin & Buntin, 2013). Optimizing and modifying EHR systems never ends and neither does the need to facilitate great acceptance among staff to ensure the implementation of the EHR. Blavin & Buntin (2013) determined that connecting with the clinicians about the EHRs in terms of quality was found to be helpful, as well as making implementation less about the technology and more about a larger strategic plan to promote better patient care. Involvement of someone respected among his/her peers whom can influence the attitudes of other co-workers is very helpful in and an important step in obtaining the buy-in of other healthcare professionals when implementing a new system. Nurses have also played key roles in helping plan EHR implementation. They are at the front line of care and are often responsible for quality improvement work, routinely interact with other departments, and nurses consider the needs of various stakeholders during the initial planning of EHR implementation (Blavin & Buntin, 2013).

Boonstra, Versluis, & Vos (2014) presented a study about implementing EHRs in hospitals that also discussed the complexity of this undertaking. They presented their results after conducting a systematic literature review of empirical research on the EHR implementation. The significant areas identified that are important to make implementation successful were EHR context, EHR content, and EHR implementation process Findings from this study also confirm Blavin's (2013) findings that EHR implementation can be a complex process but is often driven by government regulations or financial stimulations (Boonstra, Versluis, & Vos, 2014). This study brought to light that implementing information systems (IS) in hospitals is more

challenging than elsewhere because of the complexity of medical data, data entry problems, security and confidentiality, and a general lack of awareness of the benefits of IT. Boonstra, Versluis & Vos (2014) provided three reasons why hospitals differ from many industries that can affect the implementation of the EHR. The first reason is that hospitals have multiple objectives, such as curing and caring for patients, and educating new physicians and nurses. Second, hospitals have complicated and highly varied structures and processes. Thirdly, hospitals have a varied workforce including medical professionals who possess high levels of expertise, power, and autonomy (Boonstra, Versluis, & Vos, 2014). This study also brought to light that no specific theoretical frameworks had been used in the research of EHR implementation. Most articles simply state their findings and objectives as gaining insight into certain aspects of EHR implementation (Boonstra, Versluis, & Vos, 2014). The success of the implementation of the EHR and the process is determined by emphasizing the importance of focusing on both the social aspects of the EHR implementation as well as the technical aspects of the systems. Boonstra, Versluis & Vos (2014) also found that by creating synergy among the medical work practices, the healthcare professionals, the information system, and the hospital organization is necessary for implementation, and argues that this will only happen if sufficient people accept a change in work practices.

CHAPTER 3: METHODS

The purpose of this study was to determine if the ambulatory surgical services nurse spends more time on the EHR than performing hands-on patient care. The researcher conducted a quantitative analysis to determine the amount of time the ambulatory surgical services nurse is using the EHR and the amount of time he/she is performing hands-on nursing care. Prior to implementation, the university's institutional review board (IRB) reviewed and approved the intended study (Appendix A). Approval was also obtained from the institution where the study was conducted (Appendix B). This chapter provides an overview of the research methodology that was used in this study.

Research Design and Setting

A basic non-experimental descriptive research design was used for this study. This type of design provided the researcher with the opportunity to identify and describe the variables of interest (time of usage of the EHR and hands-on patient care) within a selected population (ambulatory surgical services nurses working in an ambulatory surgery department). The use of a descriptive design was an appropriate choice to evaluate the amount of time the ambulatory surgical services nurse uses the EHR and provides hands-on care because the researcher will not manipulate or control the independent variable and there is very little knowledge in this research area (McEwen & Wills, 2011).

The elements of time the ambulatory surgical services nurse is documenting in the EHR, time that the ambulatory surgical services nurse uses hands-on patient care and specifically how the use of the EHR affects the ambulatory surgical services nurse's time were explored. The study did not have an intervention or manipulation of variables and therefore was non-experimental.

The setting for this research study took place in an outpatient surgery department at a small faith based, not-for- profit hospital in the southeastern United States. Ambulatory surgical services nurses that worked in the outpatient surgery department at this hospital were given the opportunity to participate in this study.

Population and Sample

The population for the study included all outpatient ambulatory surgical services nurses in the outpatient surgery department. This included all RNs working full time, part time, and per diem in the outpatient surgery department that agreed to participate in this study.

As this study involved a small sample size, it will serve as baseline research to formulate a directional hypothesis (Polit & Beck, 2012). To estimate sample size, Cohen's *d* was used prior to data collection and indicated a sample size of 90 for a small effect, 34 for a medium effect, and 19 for a large effect related to time spent on the EHR versus hands-on care. The sample was recruited from all employees working in the outpatient surgery department as an ambulatory surgical services nurse. Recruitment took place in the department on two separate dates so that anyone that was not working on one of these days would be able to participate. Participants only participated once in the study.

Data Collection

Data were collected using time stamps for the EHR and printed forms that were distributed to participants as a packet. The packets were unmarked envelopes that contained a cover consent letter (Appendix C). Each nurse was assigned a number determined by a random drawing from an envelope. This four-digit number, specific to that nurse for the reminder of the study, was placed on the top of the preprinted time study forms that were completed (Appendix D). This was so that the data collected could be correlated to each nurse's work day and patient

care activity. Data collected for time stamps, the time when the nurse was in a patient's EHR, came from the hospital's computer software system known as CERNER. Consent for review of patient medical records was obtained from the Administrative Team and the Health Information Management (HIM) department according to the organization's policy on such. Since patient names were not used and their medical treatment was not reviewed, patient consent was not needed. Data collection occurred in four days in the month of June, 2016. Data were collected on these four days from all participants in the study. Flyers were posted in the outpatient surgery department one week prior to the data collection (Appendix E). The flyers described the study; provided the dates for information to be collected and invited all outpatient ambulatory surgical nurses to participate. The researcher was present during all days of data collection and asked the nurses if they had placed the patient's initials they had cared for on the top of their forms prior to placing them in the envelopes provided.

The researcher explained the study to all participants and answered any questions that arose. After the participants completed their forms, they were instructed to place the documents in the unmarked envelopes and seal them. Data packets were stored in a locked safe in a secure office. All data collected were reviewed at the end of the study.

Methods and Instruments

A Microsoft Excel spreadsheet was utilized to organize and calculate most of the data (Appendix F). The excel spread sheet contains six data collection columns and three calculation columns to analyze the data. The first two columns of the spreadsheet listed the date of data collection and the nurse's identification number. The third column listed the start time of the ambulatory surgical services nurse was on the EHR. The fourth column listed the stop time of the ambulatory surgical services nurse use on the EHR. The fifth column was the difference of

columns three and four to produce the number of minutes the ambulatory surgical services nurse was on the EHR. The data was calculated by imputing a formula to subtract column four from column three to obtain the number of minutes the ambulatory surgical services nurse spends on the EHR The sixth column was the start time of hands-on care by the ambulatory surgical services nurse. The seventh column was the stop time of hands-on care by the ambulatory surgical services nurse. The eighth column was the difference from column six and seven to determine the amount of minutes that the ambulatory surgical services nurse spent performing hands-on care. The same formula was used to subtract column five from column six to obtain the number of minutes that the ambulatory surgical services nurse spent performing hands-on care. The ninth and final column were the average amount of all times from column five to determine the average amount of time the ambulatory surgical services nurse was on the EHR on an average day.

After all data had been collected and documented by the researcher, an appointed reviewer reviewed 100% of the data collected and entered to verify accurateness and reliability. Any discrepancies in data collection or entry were reconciled.

Threats to Validity

There are a few possible threats to external validity that have been identified for this study. One factor that limits generalizability of findings was obtaining and utilizing data from only one hospital setting. Another was the limited number of hours studied daily.

Data Analysis

Descriptive statistics were used in the study to describe the sample using means, standard deviations, frequencies, and percentages (Polit & Beck, 2012). Inferential statistics were used to answer the research questions by comparing the data obtained. Independent t-test of the mean

values of the columns that were measured were conducted. The pre-analysis screening revealed that the proportion of the time spent in hands-on care was less than 50% of the time. A *p* value <0.05 was considered statistically significant. Data were analyzed using the SPSS version 21 software package developed by IBM.

Protection of Human Subjects

The sample patients' medical records were only reviewed for time usage of the EHR by the ambulatory surgical services nurse for time stamp information. The patient's medical care and treatment were not reviewed and their names were not included on any data collection tool or included in the research analysis. The nurses involved in the study were identified only by a four-digit code given to them randomly so that only the information obtained was associated with an identification number and not a specific nurse. The study design was sent to the Institutional Review Board (IRB) at Kennesaw State University for exemption request for research with human participants under category 4; therefore, informed consent did not need to be obtained from patients prior to data collection. The data collected was de-identified and the research was conducted on existing data. Institutional permission was also granted prior to the start of the study.

The Microsoft Excel spreadsheet and all preprinted forms used in the study were printed off the computer and were maintained in a locked cabinet in the Administrative office at the hospital during the time of the study and for a minimum of three years, and then they will be destroyed. The spreadsheet file in the computer housing the spreadsheets will be deleted after the printed copy is obtained. All data obtained in the study will remain secure. Only the researcher and collaborating nursing faculty members will have access to the spreadsheets and data files.

CHAPTER FOUR: RESULTS

This chapter includes a discussion and a summary of the data analyzed. The data analysis plan and the results of the study are presented. The purpose of this study was to determine whether the surgical services nurse spent more time on the computer or more time performing hands-on patient care during a shift and to examine the average time spent doing both. Data analysis was conducted to answer the following research questions that guided this study: 1) What is the average amount of time the ambulatory surgical services nurse spends on the EHR when preparing an ambulatory surgical patient for surgery? 2) What is the average amount of time the ambulatory surgical services nurse spends performing hands-on care when preparing an ambulatory surgical patient for surgery? 3) What is the percentage of time the ambulatory surgical services nurse spends on the EHR on an average day compared to the percentage of time spend on hands-on care?

Sample Demographics

By posted flyer solicitation, 22 ambulatory surgical services nurses were recruited to participate in this study. Of the nurses recruited, only 16 nurses agreed to do the study. Out of the 16 ambulatory surgical services nurses that completed the study, one participant was omitted due to incompleteness resulting in a total of 15 time-studies that were used for the data analysis, resulting in a usable return rate of 94%. All participants were Caucasian females between the ages of 22 and 67. All were registered nurses and employed for at least two years or more in the surgical services department within the hospital where the study took place. All participants were trained in CERNER which is the computer documentation software used in the hospital studied.

Data Analysis

Data analysis was completed using SPSS for Windows Release 21.0. A pre-analysis screening was conducted by the statistician and revealed there were no missing data from the time study form or the computer time stamps. This was to ensure the accuracy of the data entry. Descriptive statistics (frequencies, percentages, means, and standard deviations) were performed to describe the amount of time the ambulatory surgical services nurse spent on the computer and to describe the amount of time the ambulatory surgical services nurse spent performing hands-on patient care. Inferential statistics were used to compare differences between EHR time and hands-on care. Independent t-tests were used to compare the differences in the two variables of interest (time spent on the EHR and time spent on hands-on care). One-way ANOVAs were used to determine differences among the means of nurses related to the percentages of time spent on EHR or hands-on care. An alpha of 0.05 considered statistically significant.

Research Question One. The average amount of time the ambulatory surgical services nurse spent on the EHR when preparing an ambulatory surgical patient for surgery revealed that for all nurses taken in aggregate, the average number of minutes spent on the computer per day was 98.2 minutes (SD = 31.6). The 95% confidence interval for the number of minutes spent on the computer per day was from 90.0 minutes to 106.5 minutes (Table 1). The daily computer usage ranged from a minimum of 24 minutes to a maximum of 160 minutes with a mean usage of 98 minutes.

Table 1

Computer Minutes

Nurse	*Mean*	*SD*	*Minimum*	*Median*	*Maximum*
1	78.25	5.68	74.0	76.5	86.00
2	100.80	30.00	67.0	102.0	132.00
3	101.50	35.70	74.0	89.0	154.00
4	146.50	13.48	133.0	146.5	160.00
5	113.80	24.50	81.0	118.5	137.00
6	83.30	37.90	28.0	97.0	111.00
7	112.50	35.40	64.0	119.5	147.00
8	74.75	8.34	69.0	74.5	87.00
9	98.30	21.00	80.0	92.5	128.00
10	97.50	28.20	60.0	104.0	122.00
11	75.25	15.59	60.0	72.0	97.00
12	90.50	35.90	44.0	94.5	129.00
13	99.80	34.80	60.0	105.0	129.00
14	117.00	34.50	79.0	119.0	151.00
15	79.00	47.70	24.0	104.0	109.00

Research Question Two. The average amount of time the ambulatory surgical services nurse spent performing hands-on care when preparing an ambulatory surgical patient for surgery was 54.8 minutes per day with a standard deviation of 21.5 minutes. The 95% confidence interval for the number of minutes spent on the hands-on care per day was 49.1 minutes to 60.4 minutes. The daily hands-on care time ranged from a minimum of 17 minutes to a maximum of 121 minutes with a mean of 55 minutes (Table 2).

Research Question Three. The third area of study was the percentage of time the ambulatory surgical services nurse spends on the EHR on an average day compared to the percentage of time spent on hands-on care (Tables 3 & 4). For the percentage of time spent on the EHR, there was no significant difference among the means of the nurses ($F(14,44) = 1.749$, $p = 0.080$). For the percentage of time spent on hands-on care, there was no significant difference among the means of the nurses ($F(14,44) = 1.414$, $p = 0.187$). The independent samples t-test ($t(58) = 15.80$) for the difference between computer time and hands-on time

showed that there was a significant difference ($p = < 0.001$ on average, Figure 1). Considering Cohen's $d = 0.8$ is large, the effect size of this study exceeded the measure for a large effect with a result of 4.114. With a sample size of 59 data values, an effect size of 4.114, the power of this study was found to be greater than 0.999.

Averaging the days for each nurse, the smallest percentage of time that one nurse spent on the EHR was 12.5% and the greatest percentage of time spent on the EHR was 24.4%. As a percentage of the total ten-hour shift time, the average percentage of the time nurses spent on the computer was 16.3% of the total shift time with a standard deviation of 5.3%. Averaging the days for each nurse, the smallest percentage of time that one nurse spent on hands-on care was 7.3% and the greatest percentage of time spent on hands-on care was 14.5%. Overall the average percentage of time spent performing hands-on care by the nurses in this study was 9.1% with a standard deviation of 3.6%.

Table 2

Hands-On Minutes

Nurse	*Mean*	*SD*	*Minimum*	*Median*	*Maximum*
1	44.50	13.96	31.0	41.5	64.00
2	53.30	28.10	31.0	44.5	93.00
3	56.30	21.00	31.0	60.0	74.00
4	86.80	27.50	55.0	85.5	121.00
5	51.25	13.55	38.0	49.0	69.00
6	51.30	23.70	17.0	59.5	69.00
7	65.50	15.35	46.0	67.0	82.00
8	44.50	25.80	24.0	36.0	82.00
9	47.00	10.49	38.0	44.5	61.00
10	48.25	17.33	27.0	50.0	66.00
11	43.50	4.20	38.0	44.0	48.00
12	47.75	19.41	20.0	53.0	65.00
13	61.00	24.80	36.0	58.5	91.00
14	72.80	28.40	32.0	82.5	94.00
15	45.33	13.65	33.0	43.0	60.00

Table 3

Computer Percentage of Time

Nurse	*Mean*	*SD*	*Minimum*	*Median*	*Maximum*
1	13.00	0.90	12.3	12.8	14.30
2	16.80	5.00	11.2	17.0	22.00
3	16.90	6.00	12.3	14.8	25.70
4	24.40	2.30	22.2	24.4	26.70
5	19.00	4.10	13.5	19.8	22.80
6	13.90	6.30	4.7	16.2	18.50
7	18.80	5.90	10.7	19.9	24.50
8	12.50	1.40	11.5	11.9	14.50
9	16.40	3.50	13.3	15.4	21.30
10	16.30	4.70	10.0	17.3	20.30
11	12.50	2.60	10.0	12.0	16.20
12	15.10	6.00	7.3	15.8	21.50
13	16.60	5.80	10.0	17.5	21.50
14	19.50	5.80	13.2	19.8	25.20
15	13.20	8.00	4.0	17.3	18.20

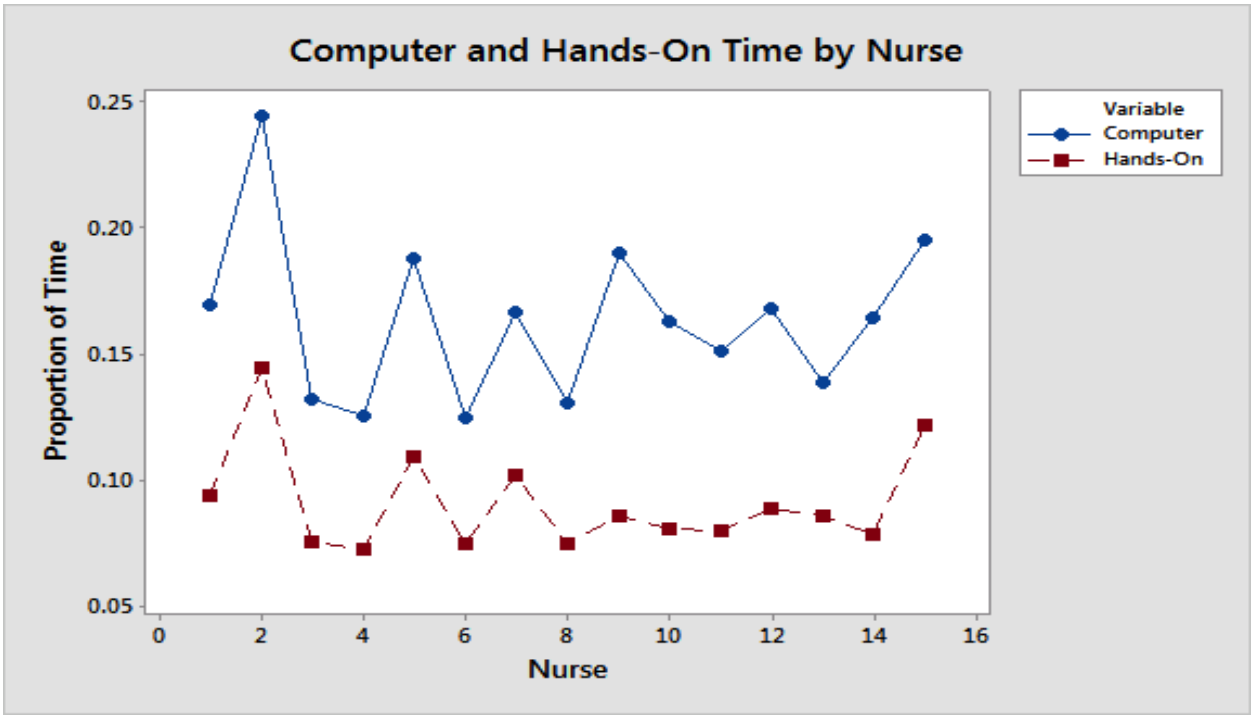
Table 4

Hands-On Percentage of Time

Nurse	*Mean*	*SD*	*Minimum*	*Median*	*Maximum*
1	7.40	2.30	5.2	6.9	10.70
2	8.90	4.70	5.2	7.4	15.50
3	9.40	3.50	5.2	10.0	12.30
4	14.50	4.60	9.2	14.3	20.20
5	8.50	2.30	6.3	8.2	11.50
6	8.50	4.00	2.8	9.9	11.50
7	10.90	2.60	7.7	11.2	13.70
8	7.40	4.30	4.0	6.0	13.70
9	7.80	1.70	6.3	7.4	10.20
10	8.00	2.90	4.5	8.3	11.00
11	7.30	0.70	6.3	7.3	8.00
12	8.00	3.20	3.3	8.8	10.80
13	10.20	4.10	0.6	9.8	15.20
14	12.10	4.70	5.3	13.8	15.70
15	7.60	2.30	5.5	7.2	10.00

Figure 1

Comparison of Proportion of EHR Time and Hands-on Time in a 10 Hour Shift



CHAPTER 5: DISCUSSION

The purpose of this chapter is to discuss the interpretations of findings to the research questions, the relationship of the findings to theory and the limitations of the study. In addition, the implications of the findings to nursing practice, education, and research as well as future implications and conclusions are discussed.

The first research question posed in this study addressed the average amount of time an ambulatory surgical services nurse spends on the EHR when preparing an ambulatory surgical patient for surgery. The researcher expected this finding as it was assumed that the ambulatory surgical services nurse spends more time on the EHR than performing hands-on patient care. Findings from this study supported that there was a statistically significant difference in the amount of time the ambulatory surgical services nurse spent on the EHR versus time performing hands-on patient care. From an evidence perspective the study found that the ambulatory surgical services nurses spent an average of 16.3% of a ten-hour shift working on a computer as compared to the findings that they only spent 9.1% of their time performing hands-on care in the same shift. Implementation of the EHR into healthcare organizations has drastically changed the work flow for staff and the EHR documentation complexity has challenged the nursing profession to meet required documentation standards in a set time allowance (Schwiran & Thede, 2011). This finding is dissimilar to Halamka (2013). Halamka (2013) found that EHRs were improving patient care and decreasing documentation times for nursing staff. This study has shown that the ambulatory surgical services nurse is challenged in meeting documentation standards and requirements as reflected in the amount of time spent on the EHR. Hummel & Evans (2012) also supports this study's findings by stating that the US government has created financial incentive for healthcare organizations and eligible professionals to us the EHR but the

"meaningful use" criteria is not always defined. Fleming et al. (2011) supports that EHRs have a variety of pitfalls associated with them that may contribute to care disruptions which can impact patient care.

The second research question posed in this study was: What is the average amount of time the ambulatory surgical services nurse spends performing hands-on care when preparing an ambulatory surgical patient for surgery? The findings from this study show the ambulatory surgical services nurse spent from a minimum of 17 minutes to a maximum of 121 minutes with a mean of 55 minutes performing hands-on care. This computed to 9.1% daily that the ambulatory surgical services nurse performed hands-on care in a 10-hour shift.

The third research question addresses the percentage of time the ambulatory surgical services nurse spends on the EHR on an average day compared to the percentage of time spent on hands-on care. The amount of time spent performing hands-on care is significantly ($p = 0.001$) different than the amount of time spent on the EHR and supports the perception that the ambulatory surgical services nurse is spending less time performing hands-on patient care than on the use of the EHR. The evidence presented in this study has supported the premise that the ambulatory surgical services nurse is spending a significantly less amount of time performing the vital aspects of hands-on care defined by ACA (2015).

Theoretical Framework

As stated previously, the Myra Estrin Levine Conservation Model theory provided the framework for this study. Levine (1973) stated that "nursing is a human interaction" (McEwen & Wills, 2014, p.237) and the findings from this study show that the ambulatory surgical services nurse has less human interaction and more focus on EHRs. ACA (2015) defines the surgical nurse time as the time the nurse spends in protection, promotion, and optimization of

health and treatment of human response. The Conservation Model reflects holism and the fact that humans (patients) are holistic beings, personal integrity is a person's sense of identity and self-definition, and all nursing interventions are to be based on careful and continued observation over time (McEwen & Wills, 2014; Levine 1973, 1990). This study brings forth the findings that the nurse is on the EHR more than being able to perform hands-on care.

Limitations

There were several limitations of this study. One limitation was that the study was only conducted in one healthcare facility located in the southeastern United States. This may limit the external validity and generalizability of the findings. Studying multiple healthcare facilities could further substantiate the findings. In addition, outpatient ambulatory surgical services nurses were recruited from one healthcare organization which may produce a homogenous population limiting the generalizability of the findings. All other nursing departments in the hospital were excluded from this study.

The second limitation to this study is that patients are in the ambulatory surgery department for limited amounts of time: therefore, completing all requirements of the EHR can cause the ambulatory surgical services nurse to have time constraints. The outpatient surgery department studied is only open during set business hours Monday through Friday and is not open on holidays or weekends. The time frame studied could have been longer. The limited time for data collection might have influenced the opportunity for all ambulatory surgical services nurses to participate in the study.

Also a noted limitation, more information regarding computer use and/or experience on computers from each participant would possibly provide more depth to the findings. Surveying for more demographic information such as history of a formal typing/computer use class, length

of time using a computer over lifetime, and prior exposure to EHR documentation would possibly provide a different perspective.

Lastly, another limitation to this study was the sample size of nurses studied. There were 22 nurses that could have participated, but only 15 completed all the requirements for the study. Small sample sizes do not provide conclusions that can be generalized to the larger population.

Conclusion and Future Recommendations

With the growing nursing shortage and the significant difference in the amount of nurses that are available compared to the amount of nurses needed, the findings from this study are valuable. Organizations need to be made aware and understand the time constraints that the EHR places on the ambulatory surgical services nurse on a daily basis and how it affects the time the ambulatory surgical services nurse spends performing hands-on care. The surveys that healthcare organizations are held to for financial reimbursement deal with the patient's perception of care and this study has brought forth evidence that the ambulatory surgical services nurse is not spending as much time with the patient performing hands-on care as they are on the EHR which may influence patient perception of care.

Based on the results of this study, several recommendations for future research can be made. First, further exploration of nurses' time spent on the EHR is needed. The small number of past studies examining this area have been limited to how well the EHR works for healthcare facilities and not actually how long does an ambulatory surgical services nurse have to complete required legal documentation. A more in depth qualitative study may assist in gaining further insight into the differences in time of EHR usage by the ambulatory surgical services nurse as compared to hands-on care provided. This study only obtained data that established that the ambulatory surgical services nurse spends more time using the EHR than providing hands-on

care. To date there have been very few studies found that specifically deal with the ambulatory surgical setting and the time constraints for completing all tasks including the use of the EHR. A multi-site study would possibly provide more generalized information regarding EHR usage by ambulatory surgical services nurses to further support this study's findings.

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Appendix A

Kennesaw State University IRB Approval Letter

From: <irb@kennesaw.edu>
Date: Mon, May 2, 2016 at 6:14 PM
Subject: Study 16-475: EFFECTS OF ELECTRONIC HEALTH RECORD USE ON THE AMBULATORY SURGICAL SERVICES NURSE'S TIME
To: Htaylo36@students.kennesaw.edu
Cc: irb@kennesaw.edu

5/2/2016
Heather Taylor

RE: Your application dated 4/29/2016, Study #16-475: EFFECTS OF ELECTRONIC HEALTH RECORD USE ON THE AMBULATORY SURGICAL SERVICES NURSE'S TIME

Dear Ms. Taylor:
Your application for the new study listed above has been administratively reviewed. This study qualifies as exempt from continuing review under DHHS (OHRP) Title 45 CFR Part 46.101(b)(2) - educational tests, surveys, interviews, public observations. The consent procedures described in your application are in effect. You are free to conduct your study.

Please note that all proposed revisions to an exempt study require IRB review prior to implementation to ensure that the study continues to fall within an exempted category of research. A copy of revised documents with a description of planned changes should be submitted to irb@kennesaw.edu for review and approval by the IRB.

Thank you for keeping the board informed of your activities. Contact the IRB at irb@kennesaw.edu or at (470) 578-2268 if you have any questions or require further information.

Sincerely,
Christine Ziegler, Ph.D.
KSU Institutional Review Board Chair and Director
cc: vwagner3@kennesaw.edu

Appendix B

Institutional Permission

Gordon Hospital

April 29, 2016

Dear Kennesaw State University IRB Board,

We support Heather Taylor in her study "*Focusing on the Effects of Electronic Health Record Use on the Ambulatory Surgical Services Nurse's Time*". We therefore give permission for her to conduct this study at Gordon Hospital.

We find this topic important and something that affects many areas of nursing care. We look forward to the results of this study and possibly sharing the findings with other facilities within our organization to further review our nurses' time use in caring for patients.

Thank you,

Jeni Hasselbrack

Jeni Hasselbrack
Associate Vice President
Human Resources
jeni.hasselbrack@ahss.org

Appendix C

Cover Consent Letter for Study

The Effects of EHR Documentation and Time Efficiency for the Ambulatory Surgical Services Nurse

Investigator Contact Information: Heather Taylor, (706)263-5891, htaylorrn1@aol.com

You are being invited to take part in a research study conducted by Heather Taylor of Kennesaw State University. Before you decide to participate in this study you should read this form and ask questions about anything you do not understand.

The purpose of this study is to explore the effects of EHR documentation on time use in the ambulatory surgery setting. It will determine the length of time the ambulatory surgical service nurse spends on the HER, the amount of time performing hands-on patient care, and examine how the HER affects the ambulatory surgical services nurse's time.

You will be asked to participate in a collection of times study. You will complete a short paper form for each patient you care for on a given shift. You will be assigned a random number that is specific to only you and is unidentifiable by anyone else. The number will only be used to identify that the information collected is coming from different nurses.

There is no known risks or anticipated discomforts by participating in this study. Although there may not be any direct benefit to you for taking part in the study, the researcher may learn more about the time usage in the ambulatory surgery setting and develop strategies to ensure a more productive time usage between the EHR and hands-on care for the ambulatory surgical services nurse.

The participation is anonymous. If you choose to participate, no identifying information will be collected. No one will be able to identify you, nor will anyone be able to determine which ambulatory surgical services nurse participated in this study. Your participation or lack of participation will not affect your employment. Nothing you say will in any way influence your present or future employment with your company.

To participate you must be 18 years of age or older. You must also be employed in the surgical services department.

Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 1000 Chastain Road, Kennesaw, GA, 30144-5591, (678) 797-2298.

PLEASE PRINT A COPY OF THIS CONSENT DOCUMENT FOR YOUR RECORDS, OR IF YOU DO NOT HAVE PRINT CAPABILITIES, YOU MAY CONTACT THE RESEARCHER TO OBTAIN A COPY

__ I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.

__ I do not agree to participate and will be excluded from the remainder of the questions.

Appendix D

Time Collection Form Used in Study

Time Study Form

Date: _____ Nurse ID # _____ Patient's Initials _____

Time on Computer:

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Time Performing Hands-On Patient Care:

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

Start: _____ Stop: _____

General Comments:

_____

_____

_____

Appendix E

Flyer About the Study

Current Ambulatory Surgical Services Nurses Needed for Research Study

Nurses currently employed in the ambulatory surgical services department are needed to participate in an original research study. The purpose of this study is to identify whether or not the ambulatory surgical services nurse spends more time on the electronic health record (EHR) or if he or she spends more time performing hands-on patient care specifically in the ambulatory surgical setting. All nurses employed in surgical services are eligible to take part in the study. Participation is voluntary and not required as part of your employment here at this organization. Whether or not you choose to participate has no impact on your job status.

The assessment tool that will be used is a simple time study form that will be filled out with each encounter you have with a patient. You will be given a four-digit ID number that will only be known to you. This number will be placed on the top of each simple study form that you fill out. You will be asked to document your times when you are on the computer and when you are performing hands-on patient care. At the end of the study your participation will be acknowledged. Your anonymous ID number will be placed in a drawing for a $25 Visa gift card. This will take place after the student participating in this study submits all collected information and has an approval for thesis completion. This will secure that no one skewed the information by winning a prize. The winning number will be posted in the break room and the prize can be picked up from the administration office. This will eliminate the possibility of the researcher and the participants interacting.

When: Tuesday, June 1st through Friday, June 4th during normal unit operating hours.

Where: Ambulatory Surgery department here at this organization.

If you have any questions about this study, please contact
Heather Taylor at 706-263-5891, htaylorrn1@aol.com

Appendix F

Microsoft Excel Spreadsheet

Collection Date	Nurse ID #	Start Time on EHR	Stop Time on EHR	Total Minutes on EHR	Start Time Hands-On Care	Stop Time Hands-On Care	Total Minutes Hands-On Care	Average Minutes on EHR