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Improving EMR Competency in First Year Nursing Students

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Abstract

Purpose: Competency in the nursing profession is a term many nurses are familiar with as it correlates to the ability to perform a task successfully. Nursing skills such as mixing insulin, giving an intramuscular injection, or taking manual blood pressure are all examples of skills evaluated during nursing school to determine the nursing students' competency level. In addition to these nursing skills, informatics competency using an electronic medical record (EMR) should be assessed as well. The goal of the project is to gain significant insight for informatics curriculum development across and within undergraduate programs at a university in Southwest Georgia (SWGAU).

Background: Currently, a new academic electronic medical record (AEMR) called Docucare has been initiated at SWGAU. Informatics competency skills checkoff on the new AEMR are not being assessed with first-year nursing students.

Methods: Conceptual and theoretical frameworks were appraised to bring theory to practice implementing the proposed project. Patricia Benner's Novice to Expert Theory and the Implementation Research Logic Model were analyzed and correlated to AEMR competency with first-year nursing students. The Plan Do Study Act method, along with the Tiger-based Assessment of Nursing Informatics Competencies (TANIC) tool were utilized to implement the simulation event.

Results: The results of the project demonstrate the importance of informatics in nursing school and indicated a significant improvement after AEMR education in a simulation activity in first-year nursing students, especially related to the clinical data management area of focus.

Conclusion: As technology changes in healthcare, it is vital academic settings should focus on improving informatics knowledge and competencies to guide nursing curriculum development.

Keywords: academic electronic medical record, Implementation Research Logic Model, competency, informatics, Novice to Expert Theory, Plan Do Study Act, TANIC

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Improving EMR Competency in First Year Nursing Students

When a nurse graduates from nursing school and finds their first job, it is expected they will receive electronic medical record (EMR) training during their first week of employment. The use of computers and EMRs can be a challenge for some who have little experience in the technology world. Due to the rapid growth in informatics and technology, many nursing schools have been slow to adopt informatics education into the nursing curriculum (Foster & Sethares, 2017). Nursing informatics is defined as the specialty integrating nursing science and computer science to manage data (McBride & Tietze, 2019). According to Weaver and O'Brien (2016), nurses are the largest group of healthcare workers to document more than any other healthcare professional while spending as much as 19% to 28% of their shift time documenting. Parthasarathy et al. (2018), stated the ability of nurses to understand and productively use the EMR for patient care is vital to the reduction of healthcare costs, the enhancement of patient safety, and the improvements to the quality of care. Their study found gaps in the preparedness of newly graduated nurses to use the EMRs within the clinical setting after nursing school graduation (Parthasarathy et al., 2018). Many of the gaps in skill areas noted in this study consisted of data entry, medication administration documentation, and various chart components to care for the patient. Although EMRs are used to promote patient safety and improve quality, they are also used to promote efficient workflows within the healthcare setting. Healthcare costs are 18% of the gross domestic product and are expected to rise to 20% by the year 2025 (McBride & Tietze, 2019). The Affordable Care Act required healthcare facilities to use EMRs to reduce healthcare costs while improving the quality of care (McBride & Tietze, 2019). Many nurses who fear computers or feel as if they have a lack of training to use computers, may not know where to look to find information such as a patient's last labs or vital signs within the system. The fear of technology experienced by some nursing students may be related to an inadequate exposure to EMR training in nursing school (Stayt et al., 2015).

Proper training can improve the nurse's confidence using the EMR and can assist the newly graduated nurse to better communicate with the patient while simultaneously providing patient care (Tizer et al., 2015). The rapid development of informatics has opened a gap between educators and nursing students in their basic knowledge and use of computers (Seo et al., 2019).

Problem Statement and Project Purpose

Computers and electronic documentation are part of the tools a nurse will use each day on the job. Much like a stethoscope or a penlight, these tools are used to make their jobs safer, efficient, and help to provide quality patient care. Electronic medical record documentation and computer competencies should be assessed prior to the nurse starting day to day job duties (Mitchell, 2015). Many healthcare organizations offer training right after their onboarding process prior to the new nurse being placed in the work area. In nursing school, these same competencies should be assessed in nursing students prior to the students beginning clinical assignments to ensure the students are prepared for electronic documentation and how to navigate the electronic medical record (George et al., 2016). Although each healthcare facility's EMR may differ by name and appearance, they each have a basic level of functionality (George et al., 2016). To ensure technology is used properly, training is vital for all healthcare professionals. Academic EMRs (AEMR) are defined as a "a fully functional system through which students can navigate technology, record documentation, and plan patient care in a simulated format" (Choi et al., 2016, p. 259).

A new AEMR has been initiated at a university in Southwest Georgia (SWGAU); however, students are not being trained on navigating the system and the students' competency levels are not being assessed. Competency using the AEMR can demonstrate the nursing student's knowledge and skill to navigate and document while caring for the patient. Badowski et al. (2018), reported EMR training is present in 56.2% of nursing programs and 40.8% of this training takes place within a

simulation experience. According to Bennett (2017), nurses were not always educated to prepare them for the actual clinical environment as it relates to the use of EMRs. This quality improvement project consisted of using first-year nursing students in a simulation experience while documenting in the AEMR to assess their competency levels after education is provided.

The purpose of this paper is to evaluate evidence-based articles, examine theoretical and conceptual frameworks, the methodology design, the nursing practice implications, results, and limitations of the project related to informatic competencies in pre-licensure nursing students.

Evidence-Based Model

Evidence based practice is the "practice based on the best available evidence, patient preferences, and clinical judgment" (Schmidt & Brown, 2019, p.4). The Johns Hopkins model is the model selected for the proposed project. The steps using the John Hopkins model are extremely important to make relevant changes in practice and to stay up to date with clinical guidelines. Each step within the evidence-based practice model is particularly important to improve patient safety, decrease costs, and improve quality in healthcare (Weberg & Davidson, 2021). Doctor of nursing practice prepared (DNP) nurses are leaders in healthcare to help facilitate change and evidence-based practice into the clinical setting (McCaffrey, 2012). The first step of the model includes observing a problem or topic of interest requiring improvement based on evidence-based practices (Schmidt & Brown, 2019). The aim of the project was to improve EMR competency in first-year nursing students by demonstrating proficiency while utilizing an EMR evaluation tool and a self-assessment questionnaire during a simulation experience. Next, the clinical question was formed to facilitate discovery about the students' self-efficacy and competency in regard to informatics (Schmidt & Brown, 2019). *Clinical Question: Can simulation-based training using an AEMR improve EMR competency by 50% among first year nursing students?*

Review of Literature

Search Strategy and Results

Literature searches were conducted using CINAHL, PubMed, and Google Scholar search engines. Additional searches occurred using reference lists and professional organization websites such as the American Nursing Informatics Association, Quality and Safety Education for Nurses, and the National League of Nursing. The following concepts were searched: *EMR competency, EMR AND nursing simulation, EMR AND undergraduate nursing, EMR nursing and student confidence level, EMR and nursing curriculum, nursing informatics AND undergraduate student, academic EMR, simulation AND EMR, and academic EMR competency.* Searches were restricted to peer-reviewed articles published between the years 2015 and 2020 to ensure relevant and current research articles. The literature search resulted in a total of 56 articles combined from the various searched topics. There were very few topics on academic EMRs. However, articles related to EMR self-efficacy, communication, and students' perceptions of EMR were included in the review. The literature review resulted in 43 articles which were selected for a review of literature analysis. Eleven articles were chosen to be critically appraised for validity and applicability to the proposed project. The eleven selected articles consisted of two randomized control trials (Level I), four mixed quasi-experimental quantitative and qualitative studies (Level IB & II), two qualitative studies (Level IV), two descriptive studies (Level VI), and one literature review study (Level VII).

The comprehensive appraisal analysis of the articles was completed using the Grades of Recommendations, Assessment, Development, and Evaluation (GRADE) assessment tool (Schmidt & Brown, 2019). The GRADE assessment tool is a tool that ranks the strength and quality of evidence into four levels (Schmidt & Brown, 2019). The synthesis of literature related to the proposed project concluded the selected articles could be summarized in two categories. These categories are: 1) the

needs and benefits of an AEMR, and 2) simulations using EMRs to promote skills, confidence, and competency.

Needs and Benefits of AEMR

In a descriptive study by Badowski et al. (2018), an emailed survey was sent throughout the United States to nursing programs to determine the use of electronic documentation in nursing programs. The hypothesis for the study examined: how the electronic health record (EHR) is used in the classroom, skills lab, or simulation lab for the purpose of simulation-based learning experiences (SBLE), what orientation is provided to students, what support is provided to faculty, and what were the contributing factors if an EHR was not utilized for the purpose of SBLEs? A total of 987 nursing programs throughout various states participated in the study containing all nursing academic degree programs. The measurements were obtained by an emailed survey with research questions consisting of nine demographic questions and 16 questions focusing on the use of EHR in SBLEs in the classroom, skills lab, and simulation lab. The surveys were voluntary and were emailed via an online survey through Qualtrics. The results consisted of 146 completed surveys which resulted in a 14.8% response rate. There were 38 states represented with 113 schools from public institutions and 33 from private institutions. There were 82 schools (56.2%) indicating the use of an EHR in the classroom, skills lab, and simulation lab and 64 schools (43.8%) indicating they did not use an EHR for SBLEs. The findings support the use of EHR to be beneficial and can enhance the students' clinical readiness. The study also suggested barriers should be removed from the schools not using an EHR in their programs to improve students' informatic competencies.

Choi et al. (2016) applied a qualitative study to explore how students, new nurses, clinical instructors, and faculty perceive the integration of AEMR into an undergraduate curriculum. From January to February 2014, four focus group interviews with 18 participants contributed including six

third-year nursing students, three new nurses, six clinical instructors, and three nursing faculty. The study used focused group interviews, one to two hours in length, with structured questions as a guide to facilitate the interview process. The research team consisted of a moderator, a facilitator, and one to two assistants in each interview. The goals of the study were introduced at the beginning of each interview session, questions were asked, responses were documented and recorded, and contributors were encouraged to communicate with each other. Transcripts were analyzed using the NVivo 10 software to extract themes and develop categories. The results of the study generated three major themes extracted from the interview data. The themes consisted of the electronic medical record as a learning tool for clinical, essential functions of AEMR, and expected outcomes of AEMR. The outcomes of the study show the study to be acceptable for educators who want to integrate EMR into curriculum and to create partnerships with clinical facilities to implement EMRs. The study also observed AEMRs can enhance student's competence before entering the nursing workforce.

Acceptance of an EMR is critical to evaluate the needs and benefits of an EMR. A study by Kowitlawakul et al. (2015) hypothesized self-efficacy of nursing students significantly influences perceived usefulness, ease of use, attitudes, and intentions to use the educational health record (EHR). This descriptive study used a cross-sectional design with a convenience sampling of 212 nursing students from Singapore to participate in the study. The electronic health record acceptance survey used in the study consisted of 17 items using a Likert scale with five domains: EMR self-efficacy, perceived usefulness, perceived ease of use, attitude toward using, and intention to use. The measurement of the study was conducted using Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) to analyze the data. The findings suggested students perceived the EHR software as useful and easy to use. The study also found students' attitudes toward technology influenced their intent to use the EHR and their self-efficacy with technology.

In a qualitative study by Elliott et al. (2018) the objective was to evaluate student engagement with simulation activity and to determine the value of the EMR activity with simulation. There were 296 nursing students participating in the simulation activity between January 2015 and January 2016. These students were asked to complete an evaluation after a simulation activity to collect data for the study. The evaluation consisted of questions about how the students engaged with the simulation activity and the value of the activity. The questions/statements on the evaluation utilized the Likert scale and simple descriptive statistics analyzed the data. There were 260 students (87.8%) agreed or strongly agreed the EMR was easy to navigate, suggesting a high level of student engagement. The findings also suggested students found it useful and a valuable opportunity to document in an EMR during simulation. In addition, the study suggested there is a need to incorporate EMRs into nurse education programs.

A literature review article by Foster & Sethares (2017) described the most current strategies used to implement informatics in nursing programs and described the facilitators and barriers to apply these strategies. There were 12 articles that were included in the review. The method included an integrative review of the literature using Whittlemore and Knafi via databases of CINAHL, Medline, ERIC, and PsychINFO searching terms of *nursing informatics AND curriculum AND education*. There were 85 articles found and reviewed. Strategies to implement informatics in nursing programs include using a learning management program to support courses, completing an EMR activity after simulation, hiring master's prepared informaticists to champion the integration, and increasing faculty competence and awareness with EMRs. In conclusion, the article suggested nursing schools need to incorporate informatics into nursing programs to facilitate nursing graduates' independence in the vast amounts of technology used in healthcare.

Simulations with EMRs to Promote Skills, Confidence & Competency

Steward et al. (2018) conducted a randomized control trial to compare the confidence and competence of newly hired registered nurses who were evaluated after EMR training using either simulation or written method. The study hypothesized EMR training would verify the learners' confidence and competence during a simulation exercise. The sample was limited to newly hired RNs who participated in EMR training at a 403-bed acute care facility in North Carolina. After training, each nurse was invited to participate in the study. The nurses were randomly separated into two evaluation groups (simulation and written) and then further separated into subgroups according to previous EMR experience. A total of 87 nurses participated in the study. EMR training was conducted in the computer lab while the written evaluation group completed evaluations. The simulation group performed evaluations within the simulation lab. The evaluation for both groups was conducted using a case study of a patient being admitted and discharged at the healthcare facility to evaluate EMR competency. Standards by the International Nursing Association for Clinical Simulation and the NLN Jeffries simulation theory were used as guidelines in the study. The completed work of each nurse was evaluated using the EMR Computer Orientation Checklist rating in three areas: functions independently, needs minimal assistance, or needs review. The Mann-Whitney U test was used to compare groups and the results showed confidence scores were not significantly different between the two groups. Significant differences between the simulation and the written groups on the medication administration record ($p < .05$) and problem lists ($p < .01$) were evident. The study also noted high-fidelity simulation is a valuable way to evaluate EMR documentation skills. Chart reviews were recommended to evaluate the accuracy of new nurses' documentation in the EMR.

The mixed quasi-experimental quantitative and qualitative article by George et al. (2016), studied the impact of using an EMR during simulation in undergraduate students. The goals of this

article were to evaluate the students' EMR competency during simulation and to examine the students' perceptions of their experience utilizing the EMR. A convenience sample of 44 baccalaureate undergraduate students participated in the study (23 students from the fall semester and 21 from the spring semester). The students completed a pretest on the navigation of the EMR in the form of a scavenger hunt which provided a baseline for accuracy and timeliness. The spring semester students were exposed to the EMR prior to the study being performed. The fall semester students had not been exposed to the EMR prior to the study. Two simulations per week for 10 weeks were performed with the students. The outcome for both fall and spring semesters proved there was a significant improvement in post-test speed and completion times. In the fall semester, there was an improvement of nine minutes and forty-three seconds and six minutes thirteen seconds for the spring semester students. The spring semester students were faster due to having exposure to the EMR previously. The findings also concluded students had fewer delays with accessing pertinent patient information and documenting the findings in the EMR to validate an increase in productivity and efficiency. Focus groups were conducted to examine the attitudes and experiences during the simulation using the EMR. Their findings concluded providing education on the software prior to simulations were needed.

Young and Jung (2015) conducted a quasi-experimental study to assess nursing students' clinical reasoning and self-confidence during a simulation exercise. There were 94 students recruited from two medical-surgical classes to participate in the non-randomized study. There were 48 students assigned to the intervention group to participate in the simulation exercise and 46 students were in the control group. The nursing students were measured on their knowledge, clinical reasoning skills, and self-confidence. The results of the study determined the students' knowledge and clinical reasoning skills were much higher after simulation. The control group had better self-confidence skills as compared to the group participating in the simulation. The increase in self-confidence in the control group could be related to

performance anxiety and poor decision making during the simulation exercise. The study further explains self-confidence could be improved with repeated simulations. The results could not be generalized from the study due to the study being performed at one school and using a convenience sample. However, the study did show adding simulation experiences to the traditional lectures are effective to increase the students' clinical reasoning.

In another quasi-experimental study by Choi et al. (2018), 75 third-year nursing students participated to be evaluated on nursing informatic competencies, critical thinking, and their satisfaction with a simulation experience. The purpose of the study was to examine the nursing students' ability to use a mobile AEMR during their practicum. The students were divided into an experimental group with 30 students to practice with the AEMR and a control group of 45 students. Two students from the experimental group and 15 students from the control group were excluded because of missing post-test completion. Both groups were given a pre-test and post-test. The experimental group was provided with a mobile device, an AEMR manual, and an hour-long training session. The training consisted of how to log in and out, how to navigate the system, and how to document in the system. The results showed a significant increase in informatics knowledge within the post-test. The differences in critical thinking were not significant between the two groups. The intervention group had an increase in satisfaction with practicum versus the control group. It was concluded the AEMR was an effective educational method to practice documentation. In addition, using the AEMR was a valuable way to practice documenting the patients' observations and interventions immediately at the bedside. The students were able to understand the patient's conditions by having access to the information at the point of care.

Stayt et al. (2015) performed a randomized control trial to determine the effectiveness of clinical simulation to improve clinical performance to recognize and manage a deteriorating adult patient. The sample consisted of 98 first-year nursing students in an adult nursing class. The control group listened

to a traditional lecture (one hour) and the intervention group participated in a simulation experience (two hours). The students completed a pre-and post-intervention objective test, a self-efficacy test, and a self-reported competency test. The test consisted of 24 objective criteria to evaluate the performance of assessing and managing a deteriorating patient. Overall, the study indicated students who completed simulation training managed the deteriorating patient more effectively.

A mixed qualitative and quantitative study by Tizer et al. (2015) examined students' informatics competency, teamwork skills, and communication skills. The study used 10 separate nursing and allied health programs with a total of 56 students participating. Each student was assigned to a group and given a case study. The objectives were to navigate and document in the EMR while promoting patient safety and teamwork with other disciplines. The evaluation of the study consisted of two assessments: 1) quantitative assessment for informatics competency to evaluate knowledge, skill, and basic computer skills using the Informatics Competency Assessment tool and 2) qualitative assessment using a post-assignment survey to assess perceptions of the assignment. The results of the study indicated a significant increase in the knowledge category ($p = < .05$). In the skills category, four of the eight categories demonstrated increases in skills ($p = <.05$) which included documentation and patient education. The post-assignment survey suggested students had a positive experience to practice teamwork, communication, and collaboration skills. In conclusion, students' knowledge and skills related to informatics, communication, documentation, and patient monitoring significantly improved.

Conceptual and Theoretical Frameworks

Healthcare facilities often have a mission or vision to serve as a compass for their employees. The nursing profession has a similar guide for nursing practice. Nurses have theoretical frameworks and evidence-based practice guiding the nursing profession (Weberg & Davidson, 2021). Conceptual and theoretical frameworks can help to serve as a roadmap to facilitate the best nursing practices. A doctor

of nursing practice prepared nurse (DNP) can help to initiate evidence-based changes in nursing practice while remaining constant with the support of theoretical concepts (McCaffrey, 2012). DNPs are leaders to use and test theories to improve clinical practice and enhance the quality of patient care (McCaffrey, 2012). The project examined two conceptual and theoretical frameworks as it related to AEMR training with first-year nursing students to improve electronic documentation competency. The first theoretical framework to be discussed is Patricia Benner's Novice to Expert Theory. Her theory will serve as the main framework for this project. The second framework to be discussed is the Implementation Research Logic Model. This model will be used as a visual representation of the project.

Essential I: Scientific Underpinnings & Benner's Theory

The use of a change theory is relevant to DNP Essential I by focusing on the scientific underpinnings of nursing (American Association of Colleges of Nursing, 2006). The scientific underpinning is how it relates to the history of nursing. Theoretical frameworks can help to provide an understanding of the stages and processes to facilitate the success of the proposed project and to guide nursing practice (McCaffrey, 2012). In addition, the foundations of science and theories and how they relate to informatics can help maximize the use of technology in healthcare (McBride & Tietze, 2019).

Patricia Benner's Novice to Expert Theory richly influenced the project and is relevant to EMR competencies in first-year nursing students. Benner's theory is the model used for the project while also using the logic model as a visualization of the project. Benner's framework helped to steer the project to direct the nursing faculty to teach and present the AEMR training and documentation in a manner consistent with her theory. Benner's theory is based upon the knowledge of nursing is best understood if it is presented to the student in a novice to expert manner (Benner, 1984). Some students attending nursing school may not have prior experience with computers, emails, or technology to help them learn to document in the AEMR. Using Benner's theory, education can be presented in a manner to start in

the beginning stages of basic computer knowledge and advance to documenting in the AEMR. Benner's theory is much like teaching in a nursing program where faculty present nursing material to students in a novice to expert manner (Benner, 1984). A nursing program offers a fundamentals of nursing course as one of the basic first courses each undergraduate nursing student will take at the beginning of nursing school. Using Benner's theory as a guide and using this same concept, AEMR education should be presented in a logical manner from novice to expert. In Table I, the five stages of Benner's Novice to Expert theory are described (Benner, 1984).

Benner's research explains nurses make transitions through five stages of development toward expertise: novice, advanced beginner, competent, proficient, and expert (Thomas et al., 2015). The nurse must progress from one level of performance before moving to the next level of performance such as from a student to becoming an expert (Thomas et al., 2015). In the initial stage, Benner describes the "novice" as the nursing student, and the newly graduated nurse would enter the workforce at a level two or at the "advanced beginner" stage (Graf et al., 2020). The student will first learn the basics and then advance their knowledge as they become more competent in a linear progression (Ozdemir, 2019). In this project, it is important the progression of the AEMR should be based on Benner's theory and progressed within each class of the nursing program (Ozdemir, 2019). For example, a new nursing student in their first or second semester may only be responsible to document within certain areas of the AEMR. A few areas within the AEMR for these students could be areas of vital signs, allergies, activities of daily living, nursing diagnosis, and physical assessment. As the student progresses in the nursing program, the areas of lab and imaging, medication recording, ordering, and nursing care plans can be initiated.

It is also important to recognize the EMR documentation competency level should be assessed prior to beginning clinical within the hospital setting. The most relevant informatic competencies for

undergraduate and graduate nursing programs are: “assessing electronic resources, ethical use of information systems, evidence-based practice skills, and skills for computer-based patient records” (ANA, 2008, p. 35). The American Nurse Association (2008) also identified competencies for undergraduate students learning basic hardware and software skills and graduate students learning innovation and change theory, national health database knowledge, and general systems theory. The informatic competencies for undergraduate students relevant to this project are for nurses who are learning about nursing or entering the nursing practice (ANA, 2008). The American Nurse Association (2008) informatic competencies for the beginning nurse entering the workforce are listed in Table II.

In addition to Benner’s theory, nursing ethics is another major contributor to the scientific underpinning of this project. Nursing ethics are essential pieces of theory and to decision making in the nursing profession (McCaffrey, 2012). The overall foundation of the nursing profession is built on the principle of caring. DNPs should be a leader of evidence-based practice and facilitate student learning to promote these practices and promote the “art” of caring. It is easy for nursing faculty to teach the science of nursing, but the “art” of nursing is often difficult to teach. It is remarkably similar to teaching the “soft skills” or what can be referred to by the author as “skills that pay the bills”. The soft skills which include caring, communication, motivation, and teamwork are what the individual possesses within and should be applied to the science of nursing. As healthcare continues to make advances in the world of technology, some ethical issues related to informatics and technology could arise such as privacy, confidentiality, autonomy, and nonmaleficence (McGonigle & Mastrian, 2018). The method of how technology is handled and used to properly care for patients are important aspects related to ethical decision making (McBride & Tietze, 2019). Newly graduated nurses may tend to focus on the technology or equipment more than focusing on the patient when providing care. Although documenting in the EMR is important, it is vital to focus on the patient and to make the patient feel as if they are

being heard. There must be a balance between documenting and caring for the patient, and new nurses may find it difficult to achieve this balance. The project can use Benner's theory to help the nursing student master the "art" in multitasking to achieve this balance during simulation experiences.

The Implementation Research Logic Model (IRLM)

The second conceptual framework/model to be discussed is the Implementation Research Logic Model (IRLM). This section will examine the relevance of the IRLM to the project of improving first-year nursing students' EMR competency by using a table format to offer visualization of the proposed project with Benner's theory as the overarching framework. Many logic models are used for program development and program evaluations (Smith et al., 2020). The IRLM helped to facilitate evidence-based interventions related to informatics and described how to improve EMR competency in first-year nursing students (Smith et al., 2020). The IRLM is a graphic model which illustrates the relationships of the elements of the project, serves as a roadmap for the project, and organizes the processes to facilitate implementation strategies (Smith et al., 2020). In Table III, the IRLM demonstrates how first-year nursing students were trained to use the AEMR. Once the students are trained, the student participated in a simulated experience while documenting and simultaneously performing patient care. The students were assessed by nursing faculty using the competency form provided to faculty by the AEMR resources. The overall goal of the project was to improve competency with electronic documentation during nursing school, upon graduation in the work environment, and to improve quality patient care. See Table III for an illustration of the project using IRLM.

Application of Benner's Theory and IRLM to Project

The project uses two conceptual and theoretical frameworks including Benner's Novice to Expert Theory and the IRLM as it related to improving documentation within first-year nursing students. Informatics is one of the essential areas for nursing education according to the Quality and Safety Education for Nurses initiative (QSEN, 2003). Essential knowledge in informatics is necessary to help in the improvement and transformation of health care to decrease costs, improve patient safety, and increase quality improvements (McCaffrey, 2012). The IRLM roadmap, along with Benner's Novice to Expert Theory, were used as a guide to facilitate and implement the project and to ensure success with first-year nursing students' EMR competencies to progress improvements in the advancements of health care.

Project Design/Methodology

The guide used for implementation of this quality improvement project is the Plan Do Study Act (PDSA) method. The PDSA is commonly used during quality improvement projects as a guide to assist in the design of a plan toward assessing a change in current practice, implementing the plan, studying the success of the plan, and enacting on the change (McCaffrey, 2012). This method is much like the nursing process approach. The assessment was performed to determine the need of this project, the planning and developing stages occurred to gain approvals for site location and Institutional Review Board (IRB). IRB approvals were obtained in May 2021. The implementation of the project began on September 1, 2021, with the recruitment of participants for the project and acquiring the participants' consent. After consents were signed, the participants were given dates and times for the event. Two students per session were within the simulation room. The simulation activity consisted of the participants completing the pre-test self-assessment, watching the AEMR educational video, participating in a simulation exercise, documenting the patient's information into Docucare, and

completing the post-testing self-assessment. The Docucare rubric was used to grade the participants' AEMR documentation of the simulation exercise. Data collection was completed on November 3, 2021. After completion of the project, suggestions will be provided to all educators at SWGAU to implement informatics competency checkoffs in first-year nursing students.

The purpose of this pre-test, post-test self-assessment quality improvement project is to evaluate undergraduate first-year nursing students' EMR competencies and learning needs by meeting the American Nurses Association scope and standards of practice of informatic competencies (2008) and the Technology Informatics Guiding Education Reform (TIGER) initiative (2009). The TIGER initiative defines informatics as a core competency for all healthcare professionals with a goal to prepare the nursing profession for the adoption and utilization of technology and informatics by recommending informatics competencies for nursing education, research, and practice (McGonigle & Mastrian, 2018). The overall primary objective of this project is to integrate an evidence-based informatics competency skills checklist within first-year nursing education to improve informatics competencies.

Tools

The tools used to apply the PDSA methodology to implement the project was the Tiger-based Assessment of Nursing Informatics Competencies (TANIC) tool by Dee McGonigle, Toni Hebda, Kathleen Hunter, and team (2015). Permission to use the tool has been granted by Professor Toni Hebda at Chamberlain College of Nursing.

In addition to the TANIC tool, an academic electronic medical record (AEMR) rubric was used to evaluate the students' simulation performances while documenting within the required areas of the AEMR after watching the educational video. The rubric and AEMR training video are from Lippincott resources in which permission has been obtained to use these resources in the project. Lippincott is the current nursing resource in which SWGAU utilizes for their undergraduate nursing education

curriculum. The AEMR for this project is also a product of Lippincott and is called Docucare. The TANIC tool and the Lippincott AEMR rubric evaluation tool are important components to identify the documentation areas in which the students may have difficulty and to identify their level of comfort and self-confidence while using technology.

Validity and Reliability

According to McGonigle & Mastrian (2018) and Hunter et al., (2015), the TANIC tool was tested using the Delphi study and then piloted through experts in which Cronbach's alpha values were calculated. McGonigle & Mastrian (2018) and Hunter et al., (2015) further state the TANIC Cronbach was 0.944 for clinical information management, 0.948 for computer skills, and 0.980 for information literacy demonstrating a strong internal consistent reliable tool. This tool consists of four parts, including demographic questions and the self-assessment questions containing a total of 85 items which cover basic computer literacy, clinical information management, and information literacy (McGonigle & Mastrian, 2018). However, several of the questions were removed from the questionnaire as they do not relate to this project. Only 60 questions out of 85 questions on the TANIC tool were used for the purposes of the project, not including the demographic section.

The demographic questions include age, gender, level of education, and previous EMR experience. The TANIC tool describes various concepts in each area in which the student will rate themselves as expert, proficient, comfortable, and beginner using a Likert scale. Currently, the validity and reliability for the AEMR rubric from Lippincott resources has not been obtained and is unknown to date. A lack of evidence about the use of this tool in the population of interest warrants a reliability analysis upon data completion. However, many schools have made recommendations on the use of Lippincott's AEMR rubric. The EMR rubric was graded based on a Likert scale of not applicable, level zero, level one, level two, and level three. Level three means the student successfully met the

expectations and the opposite; level zero means the student did not meet expectations of the required documentation.

Population

A convenience sample of first-year nursing students was used for the project. The project author's expectation was between 20-40 participants for the study to ensure validity of the project. The target sample size was determined by student enrollment with first-year nursing students each semester at SWGAU. In total, there were 25 student participants who enrolled in the project. The inclusion criteria included: English-speaking participants, first-year nursing students attending SWGAU attending fundamentals nursing course, above age 18, any gender, and any race or ethnic group. The only exclusion of participants for the study was any student who previously attended the first- year fundamentals nursing course and are retaking the course.

An invitation to participate in the study was provided to all first-year nursing students via SWGAU's school email to include the student's rights and purpose of the study. The Center for Disease Control and Prevention (CDC) COVID-19 guidelines were considered and met for the goal of obtaining participants. The invitation letter also included the details of the study, an informed consent, and statements regarding the ability to withdraw from the study at any time. Participants were informed there will be no penalty for not participating or withdrawing. Further, the letter explained privacy, confidentiality, and no benefit/compensation to the student will be gained through the completion of the study. The letter described the data collected and included statements regarding codifying the data with no personal information on the study instruments so each participant's self-assessments can remain anonymous. Further, it explained how the participants can return the completed pre-tests and post-tests in a sealed folder at the end of the simulation exercise. The sealed folders remained in a locked office. IRB approval was obtained from the student researcher's school of nursing education and also from

SWGAU to ensure protection of human subjects and privacy and confidentiality of the participants. In total, there were twenty-five participants who participated in the project. Knowledge acquired from the project will be used to add informatics competencies with informatics skills check off in the nursing curriculum.

Fiscal Consideration

There was minimal financial cost for the development and implementation of the training and simulation sessions. The doctoral student absorbed the cost of printing materials and providing snacks during the training session and simulation event. No funding was required for the project.

Ethical Considerations

Ethical considerations were considered for the project. There were no identifiable risks to the participants in the project. To provide confidentiality and privacy of the information collected in the pre- and post-testing self-assessment questionnaires, the tools used project codes for each participant. The participants were asked to not write their names on the questionnaires. To protect the data and the analysis, all documents were stored on a secure, protected site. Only the doctoral student and a statistician will have access for data analysis purposes. The questionnaires were stored in a sealed folder in a locked cabinet within a locked office. Paper documents will be shredded upon completion of the project.

Setting

The project site was held at a university in southwest Georgia region and for the purposes of the project, it is called SWGAU. This university has nursing programs from associate degree to master's degree programs. The setting was within the simulation room where there are five mannequins and only two mannequins were used for the purposes of time, confidentiality, and to decrease distractions among the participants. Each participant utilized their personal computer and/or laptop within each simulation

station. The CDC COVID-19 guidelines were followed to adhere to social distancing and sanitizing procedures during and after the simulation event.

Data Collection & Analysis

The intervention was guided by Benner's Novice to Expert Theory and the Implementation Research Logic Model. The method to implement the project was guided by the PDSA process. The project consisted of first-year nursing students attending fundamentals nursing course after receiving an invitation via SWGAU's school email to participate in the project. The invitation contained all items listed above within the population section and included a consent form. The students completed the consent form to participate. The participants were given a day and time to participate in the project. At the event, the participants took an informatics self-assessment pre-test to include demographic data (age, gender, level of education, previous EMR experience), followed by watching the AEMR training video. After the training video was viewed, the participants were engaged in a simulation activity and documented into the AEMR. After the simulation experience, the students completed a self-assessment post-test and the documentation AEMR rubric was completed as well. The papers did not have identifiable information and were stored in a safe and secured location.

The data entry was entered into the statistical analysis software called Statistical Package for the Social Sciences (SPSS) to evaluate and analyze the results of the project.

Components of Analysis & Statistical Tests

A statistician was helpful with the data analytics and the written data analysis for the project. The statistician also assisted with formulating charts and diagrams to illustrate the significance of the project and to provide the evidence to demonstrate the need to implement informatics competency skills checkoffs within first-year nursing students. Descriptive statistics was used for the project's data analysis. The results of the project will assist the nurse educator to determine the specific areas of

informatics require greater attention to ensure nursing graduates are competent after nursing school graduation. Additionally, the results will be used to determine if the clinical question was met and improved EMR competency by 50% in first-year nursing students.

Project Outcomes

Data Analysis & Descriptive Data

Descriptive statistical analysis summarized the participant's demographics, self-assessments of the pre and post testing questionnaires pertaining to two categories assessed: general computer skills/information literacy and clinical information management, as well as, the Docucare documentation rubric. Each category was statistically analyzed using traditional descriptive statistics (means, standard deviation, frequency, and percentages). Statistical testing between the pre-test and the post-test after the educational intervention was provided and the rubric will test if the clinical question was met for the purposes of the project. The tests were used to demonstrate statistical changes between the pre-test and post-test and the Docucare results after the AEMR education.

Demographic Factors

The demographic section of the survey was completed by 25 student participants. The sections consisted of age, gender, level of education, and any previous EMR experiences. The majority of participants were in the 18-21 age group range, comprising 68% (n=17). Eighty eight percent (n= 22) of the student participants were female and 12% (n=3) were male. Participants were asked in the demographic survey their level of education. The highest level of education was one person having a previous master's degree. Most participants highest level of education was a high school diploma comprising of 76% (n=19) of those who participated. Participants were asked in the demographic survey about any previous EMR experience. Out of those who participated, only 16% (n= 4) had previous

EMR experience. Appendix F, will illustrate the demographic descriptive statistics within the quality improvement project.

Results

There were 60 total questions used from the TANIC tool for the pre-test and post-test self-assessment questionnaire in this quality improvement project. Those questions were divided into two categories: 1) basic computer skills/information literacy and 2) clinical information management. The participants completed the pre-test, followed by watching an AEMR educational video. After the training, the participants completed a simple simulation exercise while documenting in Docucare. Once completed, the participants then completed the post-test questionnaire. The Docucare rubric was completed by the project investigator once the exercise was completed. Descriptive statistical analysis was utilized to explain the pre-test versus the post-test scores. Additionally, descriptive analysis was applied to evaluate the rubrics after the completion of the simulation exercise.

TANIC Tool Results

In the pre-test TANIC questionnaire related to basic computer knowledge, the mean was 169.00 (SD= 22.43). In the post-test TANIC questionnaire related to basic computer knowledge, the mean was 177.00 (SD= 28.27). In the pre-test TANIC questionnaire related to clinical information management, the mean was 17.32 (SD= 10.33) and the post-test TANIC questionnaire related to clinical information management, the mean was 27.40 (SD= 7.24). In Table VIII in Appendix D, the descriptive differences related to the mean and standard deviations are represented between the pre-tests and post-tests within both categories. Additionally, a bar chart is representing the data based on scores and percentages and can be found in Appendix C. Although the data on the TANIC tool represents many students have basic computer knowledge and computer information literacy, there were some differences noted in the category of clinical information management. The differences showed an improvement in knowledge

after EMR education related to clinical management using the AEMR. Withing the clinical information management category, there were many who marked “beginners” in most categories on the pre-test. However, after training, the post-test illustrates many who marked “comfortable” and “proficient” within most categories.

Docucare Rubric Results

In addition to the TANIC tool, there were 7 clinical documentation categories which were evaluated in the Docucare rubric. The evaluation was completed by the project investigator to examine the completeness of the clinical documentation after the simulation exercise. Descriptive statistics were applied using frequency and percentages for the evaluation. The rubric was based on a four-point Likert scale. The student participants received a level zero for “needs improvement”, a level one for “developing”, a level two for “meets expectations”, and a level 3 as “exemplary”.

For the purposes of providing the results of the Docucare rubric, each category will be discussed. The Benner’s theory of novice to expert level of competencies was applied to this rubric to measure the level of competency in documentation using an AEMR. Within the category of documenting patient information, at least 60% of the participants met expectations. In the category of documenting patient admission data, at least 80% met expectations. In the category of documenting assessment data, at least 76% met expectations. In the category of documenting activity of daily living, at least 68% met expectations. In the category of documenting the patient’s medications, at least 72% met expectations. In the category of intake and output, at least 84% were exemplary. Lastly, in the category of documenting patient’s vital signs, at least 94% were exemplary. The Docucare rubric’s results revealed more than 50% improvement after AEMR education was provided to the students during a simulation event.

In Appendix E, descriptive statistics will represent these Docucare findings.

The results of the project demonstrate the importance of informatics in nursing school and indicated a significant improvement after AEMR education in a simulation activity in first-year nursing students. The quality improvement project's results indicated a positive outcome and improvement in informatic competencies following the implementation of an evidence based EMR educational program. The results did not show a correlation between the relationship of age, highest level of education, or previous EMR experience as it related to documenting in the AEMR. Following the identification of competency needs related to informatics curriculum, the project investigator will develop a skill check list of select relevant informatic competencies to meet the standards for improving and enhancing nursing curriculum and promoting evidence-based practices.

Discussion

The primary objective of this quality improvement project was to integrate informatic competencies in a novice to expert manner at SWGAU. Additionally, another objective was to develop an informatics skill check list for all undergraduate nursing students and present it to the organization for consideration. Despite the fact the sample size was small, results were positive as informatics competencies were enhanced by those students who participated in the project. These competencies will be incorporated into other nursing skill competencies throughout the nursing undergraduate nursing programs.

Limitations

Although the quality improvement project provided valuable information on informatic competency assessments and interventions, there were barriers influencing the project. One limitation was the small sample size of students who wanted to participate. In the future, the author plans to complete another sample of students who are enrolled in adult health one course of study and have completed the fundamental of nursing course of study. Students in fundamentals of nursing are in their

very first nursing course in the program. They are usually overwhelmed and many of the participants were so concerned with completing the simulation exercise and performing a head-to-toe assessment versus completing the documentation component. Additionally, if more time was allocated to complete this quality improvement project, the author would have completed two simulation groups using the same participants. The first simulation experience prior to AEMR education and then documenting in Docucare, followed by a simulation exercise after the educational intervention with each student participant. Furthermore, due to time limitations, the project focused on one nursing school to implement. Having a poll from other nursing schools in Georgia and presenting the percentages of the schools who do not have an AEMR in their respective program, would be beneficial in further validation of the results for this quality improvement project.

Nursing Practice Implications & Leadership Recommendations

Informatics is an integral part of nursing practice as nurses use some form of technology daily. There are several nursing practice implications with the proposed project. The review of literature has strengthened the applicability to substantiate the proposed project's theory by incorporating EMR education into nursing curricula to help improve quality of care, lead evidence-based practices, and decrease healthcare costs. Documenting and managing healthcare data is crucial to improve quality patient care and support evidence-based nursing (McBride & Tietze, 2019). Having patients' health information at the point of care can increase efficiency and patient safety (Quality and Safety Education for Nurses, 2014). It is essential for nurses to be competent in informatics to also assist with healthcare organizations' performances by making positive impacts in improvement in patient care quality, decreasing costs, and improvement with patient outcomes (McBride & Tietze, 2019). The results from the literature and the project prove informatic competencies should be initiated within academia to begin the foundation of learning the basics of healthcare and technology, specifically EMRs. The National

League for Nursing's (NLN) position statement requests all academic nursing professionals require all nursing students graduate with knowledge and skills in computer literacy, information literacy, and informatics (NLN, 2008). The methodology of this quality improvement project is promising and can help to reduce informatic competency gaps in practice. Evidence of informatic competency within nursing school can help to bridge the gap into the workforce when utilizing a work based EMR for new nurse graduates. The project provided evidence using informatics competency skills check list as being an effective method to enhance informatic competency and knowledge in first-year nursing students. As technology changes in healthcare, it is vital academic settings should focus on improving informatics knowledge and competencies to guide nursing curriculum development.

The quality improvement project should use transformational leadership style methods to create and design a new and improved strategy for informatics skills in first-year nursing students. Transformational leadership is a leadership style in which leaders can encourage, inspire, and motivate to facilitate innovation and change (Albert et al., 2022). Transformational leadership can assist with building a bridge between competency as a nursing student and competency exhibited as a nurse graduate in the workforce by promoting engagement and team dynamics, while serving as a transformational agent to coach faculty members to embrace necessary changes as it relates to informatics curriculum.

Summary & Dissemination of Findings

This doctoral project provided this author with the knowledge and skills to promote change while implementing evidence-based informatic practices to enhance quality and advance nursing practices. The project also serves as a method to help bridge the gap from theory to practice from the academia setting to the workforce as it relates to nursing informatics. The author plans to disseminate the quality improvement project by presenting a poster presentation at the Georgia Nurse Leader Coalition's DNP

Symposium. To further disseminate the findings of this quality improvement project, the author plans to provide an in-service for all faculty to discuss the findings, in addition to, providing an informatic check list for future nursing students within all undergraduate programs. Additionally, the author plans to seek publication of the quality improvement project in a scholarly journal.

Conclusion

It is vital informatics is introduced in all nursing programs allowing nursing students to document using a student based AEMR. An AEMR in a nursing school clinical can be helpful to decrease computer anxiety and is crucial to prepare future nurses to become more competent in the era of electronic care to promote safe, efficient, and evidence-based care (George et al., 2016). According to the American Association of Colleges of Nurses (2008), all nursing students should have an introductory level of nursing informatics competency within their curriculum. An electronic documentation system can offer nursing students the opportunity to improve critical thinking and decision-making in a safe and controlled environment (Sweeny et al., 2019). EMR training with competency checkoffs in the nursing curriculum can promote improved competency levels with the EMRs on the job and promote more available time for bedside care (Abrahamson et al., 2015).

Nurse educators should embrace the use of AEMRs within their classrooms and clinical settings to support learning and to better prepare nursing students to function successfully within the workforce. Universities and clinical facilities should work together to help bridge the gap between theory and practice to enable students to graduate at a higher functioning level as it relates to informatics (Graf et al., 2020). As a future DNP prepared nurse, it is vital to incorporate informatic competencies to improve healthcare quality and safety (Masters, 2020).

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Table I

Benner's Novice to Expert Model

Stage 1: Novice – Entry level. Limited critical thinking. Task-based practice with frequent questions.
Stage 2: Advanced Beginner – Acceptable performance. Nursing graduates. Can perform skills after several opportunities. May still use a mentor.
Stage 3: Competent – Can perform job duties due to repetition. Views nursing process as an action list with a long-term goal or plan of care. May not see big picture of what is important.
Stage 4: Proficient – Able to clearly recognize situations as wholes not parts or simple aspects, "big picture" or long-term goal performance guided by maxims (nuances of a situation or means to an end reasoning using hypothetical imperatives).
Stage 5: The Expert – Execute practice with an intuitive grasp of each situation rapidly sorting out the exact problem without wasting time contemplating many potential options.

Table II

ANA Informatic Competencies for Beginning Nurse

A. Identify, collect, and record data relevant to the nursing care of patients.
B. Analyze and interpret patient and nursing information as part of the planning for the provision of nursing services.
C. Use informatic applications designed for the practice of nursing.
D. Implement public and institutional policies related to privacy, confidentiality, and security of information. These include patient care information, confidential employer information, and other information gained in the nurse's professional capacity.

Table III

Implementation Research Logic Model for EMR Competency in First Year Nursing Students

EMR Competency in First Year Nursing Students Logic Model

Clinical Question: **Can education improve EMR competency during simulation by 50% among first year nursing students?**

Objectives	**Outputs**		**Outcomes -- Impact**		
	Activities	*Resources*	*Short*	*Medium*	*Long*
1. Improve EMR Competency in First Year Nursing Students 2. Improve new nursing graduates' documentation quality while caring for patients at bedside. 3. Improve documentation in academic electronic medical record	1. First year nursing students will be trained on electronic documentation 2. First year nursing students will participate in simulation experience while documenting in an academic electronic medical record. 3. First year nursing students will pass EMR competency after simulation experience & training.	1. Nursing faculty 2. First year nursing students 3. Technology Professionals 4. Academic Electronic Medical Record 5. Simulation Room with technology/ computer 6. Competency form	1. Introduce students to academic electronic medical record 2. Offer training video to nursing students and participate in simulation experience 3. Utilize competency form developed by Lippincott with each student	1. Nursing student will document in appropriate areas of EMR 2. Nursing student will participate in simulation after EMR training & feel confident performing patient care & simultaneously documenting. 3. Nursing student will pass EMR competency	1. Improve confidence in nursing student as it relates to EMR documentation for all newly graduated nurses. 2. Improve workforce EMR competency for newly graduated nurses. 3. Improve the skill of performing patient care while simultaneously documenting in EMR.

Assumptions

1.After academic EMR training provided, it is expected the first-year nursing student will have improved competency level with electronic documentation.
2. After competency levels show improvements, it is assumed other nursing faculty will utilize EMR competency forms for first year nursing students within various programs.
3. It is assumed that newly graduated nurses will demonstrate improvements in electronic documentation utilizing a work based EMR.
4. It is assumed that improved competency levels will overall have a great impact on improving quality patient care, decreasing costs, and improved patient outcomes.

DNP PROJECT 2020-2021
Laura Gosa

Appendix A

Evidence Matrix Table

<table>
<tr><td colspan="4">George, N., Drahnak, D., Schroeder, D., & Katrancha, E. (2016). Enhancing prelicensure nursing students' use of an electronic health record. Clinical Simulation in Nursing, 12(5), 152-158. http://dx/doi.org/10.1016.j.ecns.2015.11.006of</td><td>Level of Evidence
Mixed study: 1B
Strong recommendation: high quality of evidence.</td></tr>
<tr><th>Hypothesis/Questions</th><th>Design</th><th>Sample</th><th>Measurement</th><th>Results/Implications</th></tr>
<tr><td>1st-Will exposure to EMR in nursing school improve accuracy and timeliness of electronic documentation?

2nd-Would exposure to EMR during nursing school simulations decrease anxiety, promote clinical judgement, and improve patient safety?</td><td>Quasi-experimental Quantitative and Qualitative pilot study</td><td>N=44 undergraduate nursing students (23 fall semester and 21 spring semester)</td><td>Pre-test and Post-test

Comparison of Scavenger Hunt time and accuracy in EMR documentation. Scavenger Hunt developed by Archetype Innovations utilizing a 15 question to determine participants abilities to use the EMR.

Group 1: Spring semester students had previous EMR experience
Group 2: Fall semester students had no EMR experience

Student focus group with interviews on experiences and perceptions to using the EMR.</td><td>Group 1 had improvements of 6 minutes 13 seconds with no significant difference in accuracy from baseline

Group 2 had improvements 9 minutes 43 seconds With no significant difference in accuracy from baseline</td></tr>
<tr><td colspan="4">Young, K. & Jung, K. (2015). Effects of simulation on nursing students' knowledge, clinical reasoning, and self-confidence: A quasi-experimental study. Korean Journal of Adult Nursing, 27(5), 604-611. http://dx.doi.org/10.7475/kjan.2015.27.5.604</td><td>Level of Evidence
Level I B; Strong recommendation: high quality of evidence</td></tr>
</table>

Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
1st-Does one-time simulation experience to the didactic curriculum result in improved nursing students' related knowledge acquisition? 2nd-Does the one-time simulation experience to the didactic curriculum result in improved nursing students' clinical reasoning skills? 3rd- Does the one-time simulation experience to the didactic curriculum result in improved nursing students' self-confidence?	Quasi-experimental Quantitative study	N=94 Medical surgical nursing students in a non-randomized study (48 students within simulation group and 46 students within the control group-no simulation experience)	The variables to measure were on knowledge, clinical reasoning, and self-confidence. Student knowledge was measured on a 10-question test on the student's ability to apply knowledge by determining the number of correct answers by 2 faculty experts. Student clinical reasoning was measured with a rubric with 4 phases: collecting data, diagnosing, prioritizing the problem, and planning. Validity was determined by review of 3 faculty. Student self-confidence was measured by a modified Hicks questionnaire comprised of 11 items with a 5-point Likert scale in 8 domains to consist of: recognizing change in condition, perform assessments, interpret data, perform intervention, evaluation, communication, patient safety, and role of team.	Knowledge scores were: M=6.84, SD=1.93 in simulation group and M=5.70, SD=2.38 in control group. t=2.55, p=.012 Clinical reasoning scores were: M=6.34, SD= 1.88 in simulation group and M=5.22, SD=1.94 in control group. T=2.83, p=.006 There was no significant difference between the groups with self-confidence T= -0.81, p= .418
Choi, M., Lee, H., & Park, J. (2018). Effects of using mobile device-based academic electronic medical records for clinical practicum by undergraduate nursing students: A quasi-experimental study. *Nurse Education Today*, *61*, 112–119. https://doi.org/10.1016/j.nedt.2017.11.018				**Level of Evidence** Level I B Strong recommendation: high quality of evidence

Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
If students use an AEMR in practicum, will the nursing students be able to attain competence in healthcare decision making and improve nursing informatics competencies?	Quasi-experimental quantitative design using convenience sampling method	75 third-year nursing students with 30 assigned to the experimental group and 45 assigned to the control group. *Note: 2 from experimental group and 15 from the control group were excluded.	Measurement of nursing informatic competencies, critical thinking skills, and satisfaction with practicum experience were measured. Informatic competencies were measured based on the Chung and Staggers Scale with 33 items selected from the scale. Critical thinking skills were measured by the Critical Thinking Disposition scale which consisted of 27 items with a five-point Likert scale. Satisfaction scores were measured by using 12 items on a four-point Likert scale which pertained to communication, assessments, documentation, and understanding of problems.	Informatic competency scores were significantly improved between the pre- and post-test with t=2.292, p = 0.030. Specifically, an increase in education on computer skills, privacy/security, and on informatic knowledge with experimental group. The pre-test and post-test showed little changes between the control group and the experimental group. t= 1.920, p= 0.060 Specific items pertaining to satisfaction (preparation of diagnostic testing, understanding results), the experimental group was higher than control group t= 2.217, p= 0.031 and with relation to nursing documentation, the experimental group was higher t = 2.217, p= 0.031
Badowski, D., Horsely, T., Rossler, K., Mariani, B., & Gonzalez, L. (2018). Electronic charting during simulation: A descriptive study. *Computer Informatic Nurse,* (36), 430-437				**Level of Evidence** Level VI Strong recommendation;

				Low-quality of evidence
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
1) How is the electronic health record (EHR) being used in the classroom, skills lab, or simulation lab for the purpose of simulation-based learning experiences (SBLE)? 2) When the EHR is used in SBLEs, what orientation is provided to students? 3) When the EHR is used in SBLEs, what support is provided to faculty? 4) For programs not using the EHR, what were the contributing factors?	Level VI Descriptive Study with a convenience sample with a survey to answer research questions.	Total of 987 nursing programs throughout various states participated in the study containing all nursing academic degree programs.	Survey with research questions consisted of nine demographic questions and 16 questions focusing on the use of EHR in SBLEs in the classroom, skills lab, and simulation lab. The surveys were emailed via an online survey through Qualtrics. The surveys were voluntary, and completion of the surveys were the consent as well.	146 completed surveys resulted in 14.8% response rate. 38 states were represented with 113 schools from public institutions and 33 from private institutions. 82 schools (56.2%) indicated they use an EHR in the classroom, skills lab, and simulation lab. 64 schools (43.8%) indicated they did not use an EHR for SBLEs.
Stayt, L., Merriman, C., Ricketts, B., Morton, S., & Simpson, T. (2015). Recognizing and managing a deteriorating patient: A randomized controlled trial investigating the effectiveness of clinical simulation in improving clinical performance in undergraduate nursing students. *Journal of Advanced Nursing, 71*(11), 2563-2574. doi: 10.1111/jan.12722				**Level of Evidence** Level: I A; Strong recommendation: High-quality of evidence

Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
Is clinical simulation more effective than traditional classroom teaching in developing skills required to recognize and respond effectively to a deteriorating patient?	Level: I A Randomized Control Quantitative Study	98 first-year BSN nursing students in adult nursing class in a randomized study. One group in a control group with traditional lecture (1 hour) and one group in an intervention group with simulation experience (2 hour).	Participates completed a pre- and post- intervention objective and self-efficacy and self-reported competency scores were measured. The test consisted of 24 objective performance criteria in performance of assessing and managing a deteriorating patient. Students were also asked to complete a General Perceived Self Efficacy Scale and Self-Reported Competency.	Control group score of 7.0-21.5, mean of 13.2, SD=4.8 and the intervention group score was 11.5-24.0, mean of 18, SD=3.2 indicating the intervention group performed significantly better. From the General Perceived Self-Efficacy and Self-Reported Competency scores, there was a significant increase in both groups. Overall, the study indicated students who completed simulation training managed the deteriorating patient more effectively.
Choi, M., Park, J., & Lee, H. (2016). Assessment of the need to integrate academic electronic medical records into the undergraduate clinical practicum. *CIN: Computers, Informatics, Nursing*, *34*(6), 259–265. https://doi.org/10.1097/cin.0000000000000244				**Level of Evidence** IV; Strong recommendation; Low-quality evidence
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
The purpose of the study was to explore how students, new nurses, clinical instructors, and faculty perceive the integration of AEMR into the undergraduate curriculum.	Qualitative Study with purposive sampling	From January to February 2014, four focus group interviews with 18 participants participated including 6 third-year nursing students, 3 new	The study used focused group interviews with structured questions to guide the focus groups. The research team consisted of a moderator, a facilitator, and one-two assistants. Goals were introduced at the beginning of the sessions, questions were asked, responses were documented and recorded, and participates were encouraged to	Three major themes were extracted from the interview data. The themes consisted of electronic medical record as a learning tool for clinical, essential functions of AEMR, and expected outcomes of AEMR.

		nurses, 6 clinical instructors, and 3 nursing faculty.	communicate with each other. Each interview was about 1.5 hours long. Transcripts were analyzed using the NVivo 10 software to extract themes and develop categories.	The outcomes of the study show the study to be acceptable for educators who want to integrate EMR into curriculum and partnership with clinical facilities to implement EMRs with student learning. Participates also noted from the study, AEMRs can enhance student's competence with EMRs before entering the workforce.
Steward, D., Mullinix, C., & Wu, Q. (2018). Written versus simulation-based evaluation methods to assess competency and confidence in the use of electronic medical records. *Journal of Continuing Education, 49*(6), 262-268.				**Level of Evidence** I A; Strong recommendation; High-quality evidence
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
The study hypothesized that using simulation to evaluate EMR training would verify the learners' confidence and competence as well as the written form.	Level: I A Randomized Control Trial	Limited to newly hired RNs who participated in EMR training at a 403-bed acute care facility in North Carolina. After training, each were invited to be a part of the study. All agreed and signed consent forms. The nurses were randomly separated into two evaluation groups	. EMR training was conducted in the computer lab following the written evaluation group remaining in this lab to complete evaluations. The simulation group performed evaluations within the simulation lab. The evaluation for both groups was a case study of a patient being admitted and discharged to evaluate EMR competency. Standards by International Nursing Association for Clinical Simulation and the NLN Jeffries simulation theory were used as guidelines to develop environment. The completed work was evaluated using the EMR Computer Orientation Checklist	The mean total confidence scores were not significantly different between the two groups. Significant differences between the simulation and the written groups on the medication administration record $p < .05$ and problem lists $p < .01$. The study also noted that high-fidelity simulation is a valuable way to evaluate EMR documentation skills. The study also noted chart reviews need to be performed to

		(simulation and written) and then further separated into subgroups according to previous EMR experience. A total of 87 nurses participated in study.	from 14 areas rating them in three areas: functions independently, needs minimal assistance, or needs review. The Mann-Whitney U tests were used to compare groups.	evaluate accuracy of documentation.
Kowitlawakul, Y., Chan, S., Pulcini, J., & Wang, W. (2015). Factors influencing nursing students' acceptance of electronic health records for nursing education (EHRNE) software program. *Nurse Education Today*, 35, 189-194. http://dx.doi.org/10.1016/j.nedt.2014.05.010				**Level of Evidence** VI; Strong recommendation; Moderate-quality evidence
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
The computer self-efficacy of nursing students significantly influences perceived usefulness, ease of use, students' attitudes, intentions to use the EHRNE	Level: Descriptive Study using cross-sectional design with convenience sampling	212 nursing students from Singapore participated in study.	The electronic health record acceptance survey was used in the study and consisted of 17 items with a 5-Likert scale using 5 domains: EHRNE self-efficacy, perceived usefulness, perceived ease of use, attitude toward using, and intention to use. SPSS and AMOS version 21.0 were used to analyze the data.	The findings suggested the students perceived the EHRNE software as useful and easy to use for learning. The study found that students' attitudes toward technology influences the intent to use it and their self-efficacy.
Elliott, K., Marks-Maran, D., & Bach, R. (2018). Teaching student nurses how to use electronic patient records through simulation: A case study. *Nurse Education in Practice*, 30, 7-12. http://doi.org/10.1016.j.nepr.2018.02.003				**Level of Evidence** IV; Strong recommendation; Low-quality evidence

Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
The aim of the evaluation was to evaluate the students' engagement with the simulation activity and determine the value of the EMR activity with simulation.	Qualitative Study	296 nursing students participated in the simulation activity between January 2015 and January 2016	Participates were asked to complete an evaluation after a simulation activity to collect quantitative data. Questions were asked about how the students engaged with the sim activity and the value they placed on the activity. Questions/Statements on the evaluation utilized the Likert scale. Simple descriptive statistics was used to analyze the data.	260 students (87.8%) agreed or strongly agreed the EMR was easy to navigate suggesting high level of student engagement. The findings also suggested the students found it useful and valuable to have the opportunity to document in EMR during simulation. The findings also suggest there is a need to incorporate EMRs into nursing education programs.
Foster, M. & Sethares, K. (2017). Current strategies to implement informatics into the nursing curriculum: An integrative review. *Journal of Nursing Informatics, 21*(3), 1-4				**Level of Evidence** Strong recommendation; Low-quality of evidence VII Literature Review
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
The aim of this article was to describe the most current strategies that were used to implement informatics in nursing programs and describe the facilitators and barriers used to implement informatics in nursing programs.	Level: VII Literature Review	12 studies were included in the review.	. An integrative review of literature performed using Whittlemore and Knafi via databases of CINAHL, Medline, ERIC and PsychINFO searching terms of nursing informatics AND curriculum AND education. 85 articles were found.	Strategies to implement informatics in nursing programs included: using a learning management program to support courses, students complete EMR activity after simulation, focus on training to include informatics and what to include, hiring Master's prepared informaticists to champion the

				integration, increase faculty competence and awareness with EMRs. In conclusion, nursing schools need to incorporate informatics into nursing programs to facilitate nursing graduates to function in the highly tech healthcare realm.
Tizer, J., Swenty, C., & Wilson, G. (2015). Interprofessional education: Lessons learned from conducting an electronic health record assignment. *Journal of Interprofessional Care, 29*(6), 536-540. http://doi.org/10.3109/13561820.2015.1021000				**Level of Evidence** II; Strong recommendation; High-quality evidence
Hypothesis/Questions	**Design**	**Sample**	**Measurement**	**Results/Implications**
The objective of this study was to evaluate students' informatics competency, teamwork skills, and communication skills.	Mixed study: Quantitative and Qualitative Study	The study used 10 separate nursing and allied health programs totaling 56 students. Each student was assigned to a group and given a case study. The objectives were to navigate and document in the EMR while promoting patient safety and work as a team among other disciplines.	Two evaluations were used: 1)Quantitative assessment for informatics competency to evaluate knowledge, skill, and access to using basic computer skills via the Informatics Competency Assessment tool. 2) Post-assignment survey to assess perceptions of the assignment.	There were significant increases in knowledge category p= < .05. In the skill category, four of the eight categories demonstrated increases in skill p = <.05. The survey indicated the students had a positive experience to practice teamwork, communication, and collaboration skills. In conclusion, the students' knowledge and skills related to informatics, communication, documentation, and patient monitoring significantly improved.

Appendix B

Project Implementation Plan Timeline

Improving EMR Competency in First-Year Nursing Students

August 2021

- Attend Intensive Day
- Attend American Nursing Informatics Association Conference
- Start recruitment of participants for project (IRB obtained in May)
- Begin data collection
- Meetings with external experts and simulation teams
- Send IRB approval letters (GSU & ASU) to Ms. Sue Hopkins
- Schedule meetings for fall semester with DNP team members
- Input hours into Typhon

September 2021

- Continue with data collection (simulations, pre-testing, post-testing)
- Continue to meet with DNP team members
- Continue with meetings with external experts and simulation teams
- Continue with review of literature
- Work on methodology paper and project implementation plan
- Schedule times to meet with statistician
- Input hours into Typhon

October 2021

- Finalize data collection (simulations, pre-testing, post-testing)
- Continue to meet with DNP team members
- Continue with meetings with external experts and simulation teams
- Continue with review of literature
- Continue to work on methodology paper and start digital poster
- Build SPSS to start input of data
- Input hours into Typhon

November 2021

- Meet with statistician to assist with analyzing data
- Start with data analyzing data and results
- Continue with meetings with DNP team members
- Continue with meetings with external experts and simulation teams
- Input hours into Typhon

December 2021

- Continue with meetings with DNP team members
- Continue with meetings with external experts and simulation teams
- Input hours into Typhon
- Continue to analyze data (making charts, analyzing results)
- Start with dissemination of information/Conclusion
- Meet with statistician

January 2022

- Continue with meetings with DNP team members
- Continue with meetings with external experts and simulation teams
- Attend Spring 2022 Intensive Day
- Input hours into Typhon
- Continue with dissemination of information/analyzing results/Conclusion
- Start to build the data analysis and results into Project Proposal PPT

February 2022

- Finalize project paper and PPT
- Meet with DNP team members
- Meet with external experts and simulation teams

March 2022

- Meet with DNP team members
- DNP defense in Atlanta

April 2022

- Graduate from the DNP program with my DNP
- Apply for Georgia Board Certification Exam in Informatics
- Take Georgia Board Certification Exam in Informatics

Appendix C

Stamped Consent Form

Georgia State University
Informed Consent

Title: Improving EMR Competency in First Year Nursing Students
Principal Investigator: Dr. Modpeola Adebayo
Co-Investigator: Dr. Sarah Killian
Student Principal Investigator: Laura Gosa

Introduction and Key Information

You are invited to take part in a research study. It is up to you to decide if you would like to take part in the project.

The purpose of this research study is to gain significant insight for informatics curriculum development across and within undergraduate programs at Albany State University.

Your role in the study will be for a one-time education and simulation event which will take place during a period between May 2021 to May 2022. The one-time event may last between 2-4 hours.

You will be asked to do the following: take a self-assessment informatic pre-test, watch an educational video on navigating and documenting in an electronic medical record (EMR), take part in a nursing simulation event in the simulation center, document the patient's findings in the electronic medical record, and complete the event by taking the self-assessment post-test. The student principal investigator will assess your documentation competency with an electronic medical record rubric after the simulation event.

Participating in this study will not expose you to any more risks than you would experience in a typical day at the school.

This study is not designed to benefit you. Overall, the goal is to gain information about specific informatics content which requires greater attention for curriculum development to ensure nursing students are competent with the basics of computers and documentation in the electronic medical record after nursing school graduation.

Purpose

The purpose of the research study is to evaluate first-year nursing students' EMR competencies and learning needs to integrate an evidence-based informatics competency skill checklist after providing EMR education. You are invited to take part in this research study because you are a first-year undergraduate nursing student attending Albany State University, 18 years of age or older, speak English, and have no prior attendance with any previous nursing course or program."

A total of 20-40 students (from semester enrollments) will be invited to participate in the project with a goal of at least 20-40 students consenting to take part.

Procedures

If you decide to take part in the study, you will take part in a simulation event at the nursing simulation lab located at Albany State University's Darton College of Health Professions West Campus. The below is a list of activities to describe the event:

- You will be invited to take part of the project via an emailed invitation.
- You will sign the consent form to take part in the project and return to the project investigator either by signing electronically (attaching signature via the email), or printing and signing and returning.
- You will be provided a day and time for the simulation event which will be located at the nursing center's simulation lab in Building L at Albany State University's Darton College of Health Professions at 2400 Gillionville Road, Albany, Georgia.
- The allotted time to complete the project and all the tasks will take between 2-4 hours. You will only need to participate in the project during a one-time event.
- You will be given a self-assessment pre-test questionnaire to answer questions about your computer knowledge and skills. The questionnaire should not take more than 10 minutes to complete. The questionnaire will be in a scale form for you to circle your comfort and confidence level to each question asked on the form. The questionnaire also has a demographic section which asks your age, gender, level of education, and previous electronic medical record experience.
- Next, you will watch an academic electronic medical record training video which is 10 minutes long.
- You will then participate in a basic simulation exercise using the mannequins and will role play as the nurse to assess and document the patient's findings in the electronic medical record. For the simulation portion of the study, you may spend 20-30 minutes performing this activity.
- After the simulation event, you will complete the post-test self-assessment questionnaire.
- You will be in the simulation room with the student principal investigator and Albany State's simulation coordinator during the event. There will be no recording of the event. All questionnaires and rubric papers will be shredded after the study has been completed. All documentation and questionnaires will not contain your identity. All documentation will be stored in a locked cabinet, in a locked room. Any statistical data on the computer will be on a password- and firewall-protected computer.

Future Research

Researchers will remove information that may identify you and may use your data for future research. If we do this, we will not ask for any additional consent from you.

Risks

In this study, you will not have any more risks than you would in a normal day of life. No injury is expected from this study, but if you believe you have been harmed, contact the research team

GSU APPROVED IRB NUMBER: H21566
IRB APPROVAL DATE: 05/06/2021
Version Date: 02/18/2021

as soon as possible. Georgia State University and the research team have not set aside funds to compensate for any injury.

Benefits

This project is not designed to benefit you personally. Overall, we hope to gain information about informatics competencies in first-year nursing students to start an informatics skills checkoff after EMR training is provided to enhance informatics curriculum at Albany State University. However, you may learn techniques when documenting in an electronic medical record and may gain knowledge on the electronic medical record used during the nursing program at Albany State University.

Alternatives

The alternative to taking part in this project is to not take part in the project.

Voluntary Participation and Withdrawal

You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop at any time.
You may refuse to take part in the study or stop at any time. This will not cause you to lose any benefits to which you are otherwise entitled. The student principle investigator is the instructor for this class. No preference will be given to those who participate. The decision to participate, or not take part, will have no effect on your grade or standing in this class.

Confidentiality

We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:

- Georgia State Project Team (Dr. Modpeola Adebayo, Dr. Sarah Killian, and Laura Gosa)
- GSU Institutional Review Board
- Office for Human Research Protection (OHRP)
- Statistician

We will use a code to identify each questionnaire rather than your name on project records. You will be asked to place the first initial of your mother's maiden name with the last two numbers of your year of birth on all forms which will include the demographic form, the pre-test and post-test questionnaire and the electronic medical rubric form so the data can be linked. The information you provide will be stored in a locked cabinet within a locked office. Information on the computer will be protected by password and firewall protected computers. We want to let you know that because the questionnaires do not have your name or address on them, we might not know which questionnaire is yours. If you do not want us to use your information anymore, we will stop using it, but any information that we have already used in the project will not be removed.

Version Date: 02/18/2021

GSU APPROVED IRB NUMBER: H21566
IRB APPROVAL DATE: 05/06/2021

When we present or publish the results of this project, we will not use your name or other information that may identify you.

Contact Information

Contact Laura Gosa, student Project Investigator at laura.gosa@asurams.edu or by phone at 229-886-0024 or you may contact Dr. Modpeola Adebayo at madebayo1@gsu.edu or by phone at 404-413-1487

- If you have questions about the study or your part in it.
- If you have questions, concerns, or complaints about the study.

The IRB at Georgia State University reviews all research that involves human participants. You can contact the IRB if you would like to speak to someone who is not involved directly with the study. You can contact the IRB for questions, concerns, problems, information, input, or questions about your rights as a research participant. Contact the IRB at 404-413-3500 or irb@gsu.edu.

Consent

We will give you a copy of this consent form to keep. If you are willing to volunteer for this research, please sign below.

_____
Printed Name of Participant

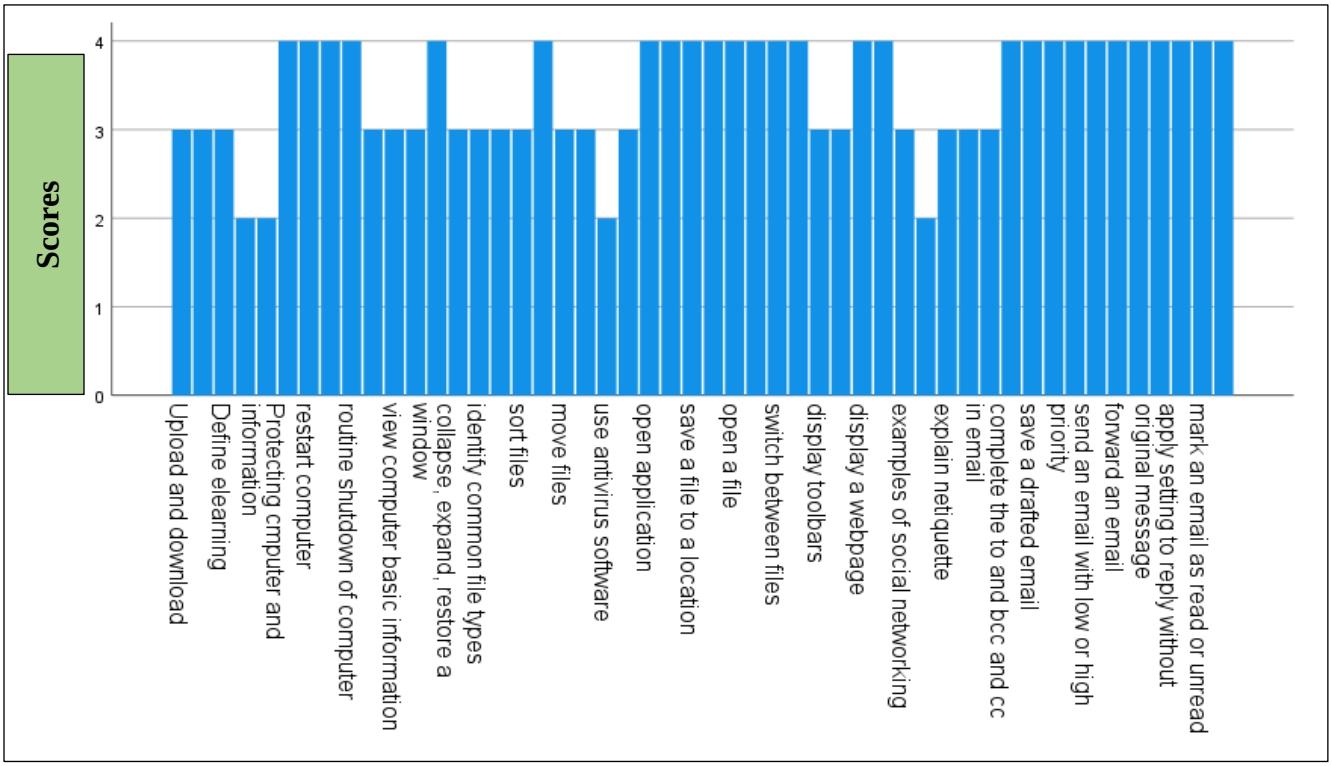
_____ _____
Signature of Participant Date

_____ _____
Principal Investigator or Researcher Obtaining Consent Date

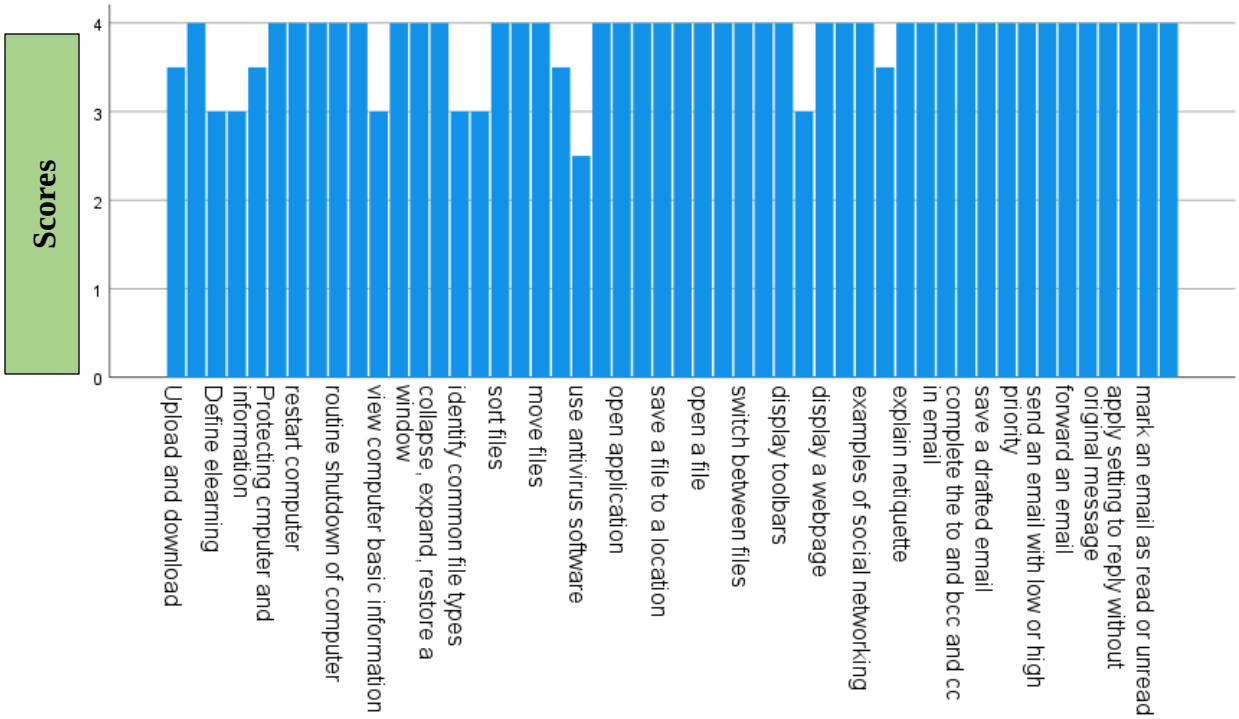
Appendix D

Scores and Percentages on TANIC Tool

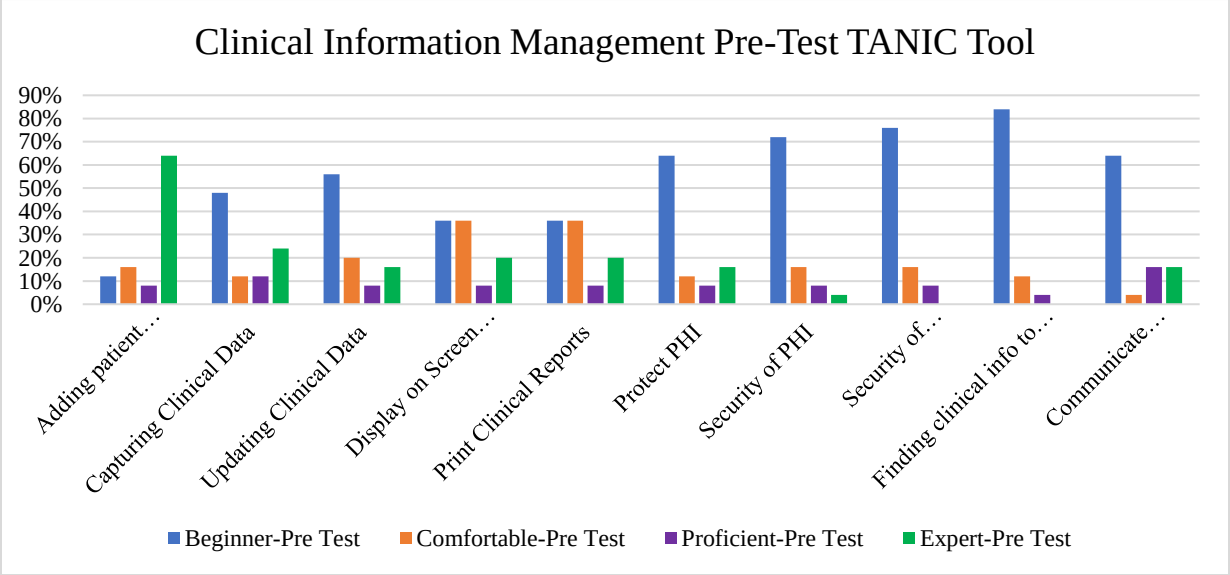
PRE-TEST Basic Computer Skills (TANIC Tool)



POST-TEST Basic Computer Skills (TANIC Tool)



Clinical Information Management Pre-Test TANIC Tool



Clinical Information Management Post-Test TANIC Tool

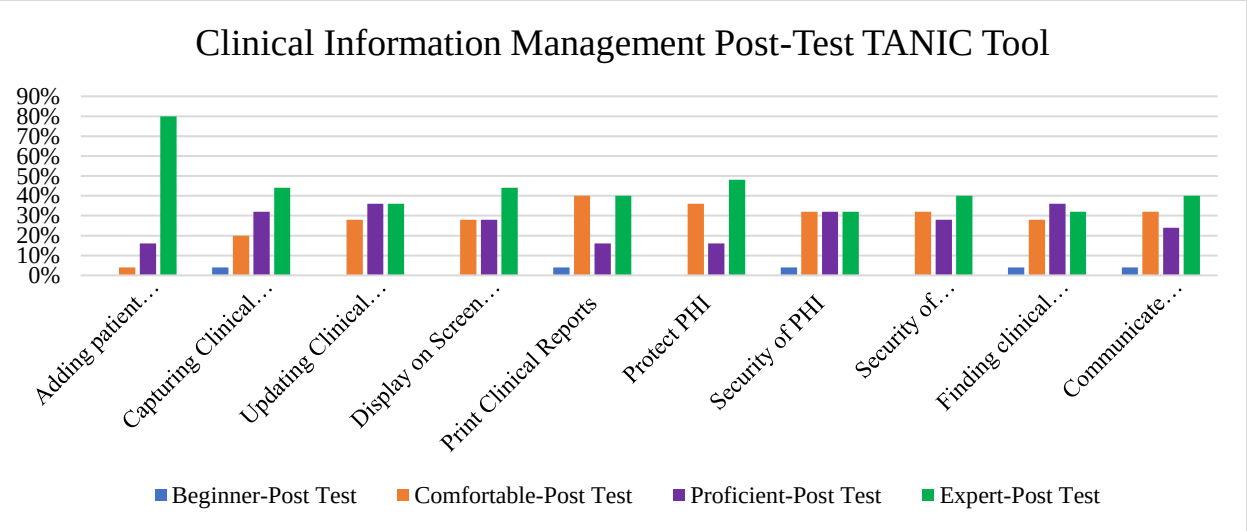
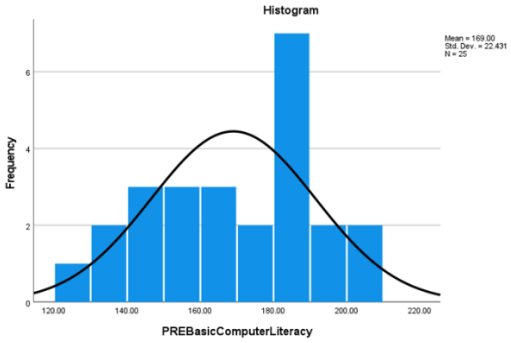
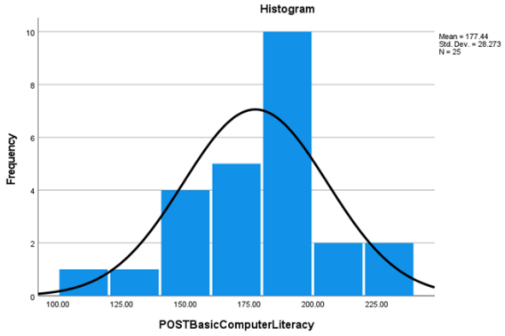


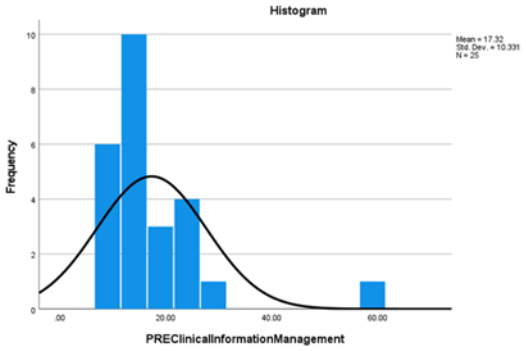
Table VIII

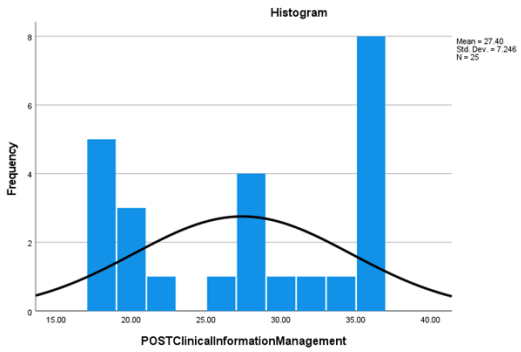
Pre-Test and Post-Test related to Basic Computer Skills/Information Literacy





Pre-Test and Post-Test related to Clinical Information Management





Appendix E

Docucare Descriptive Statistics

Docucare Rubric Descriptive Statistics

Docucare patient information

	N	%
Needs significant improvement	1	4.0%
Developing	1	4.0%
Meets expectations	15	60.0%
Exemplary	8	32.0%

Docucare patient admission data

	N	%
Developing	2	8.0%
Meets expectations	20	80.0%
Exemplary	3	12.0%

Docucare patient assessment data

	N	%
Developing	4	16.0%
Meets expectations	19	76.0%
Exemplary	2	8.0%

Docucare patient activity of daily living

	N	%
Developing	1	4.0%
Meets expectations	17	68.0%
Exemplary	7	28.0%

Docucare patient MAR

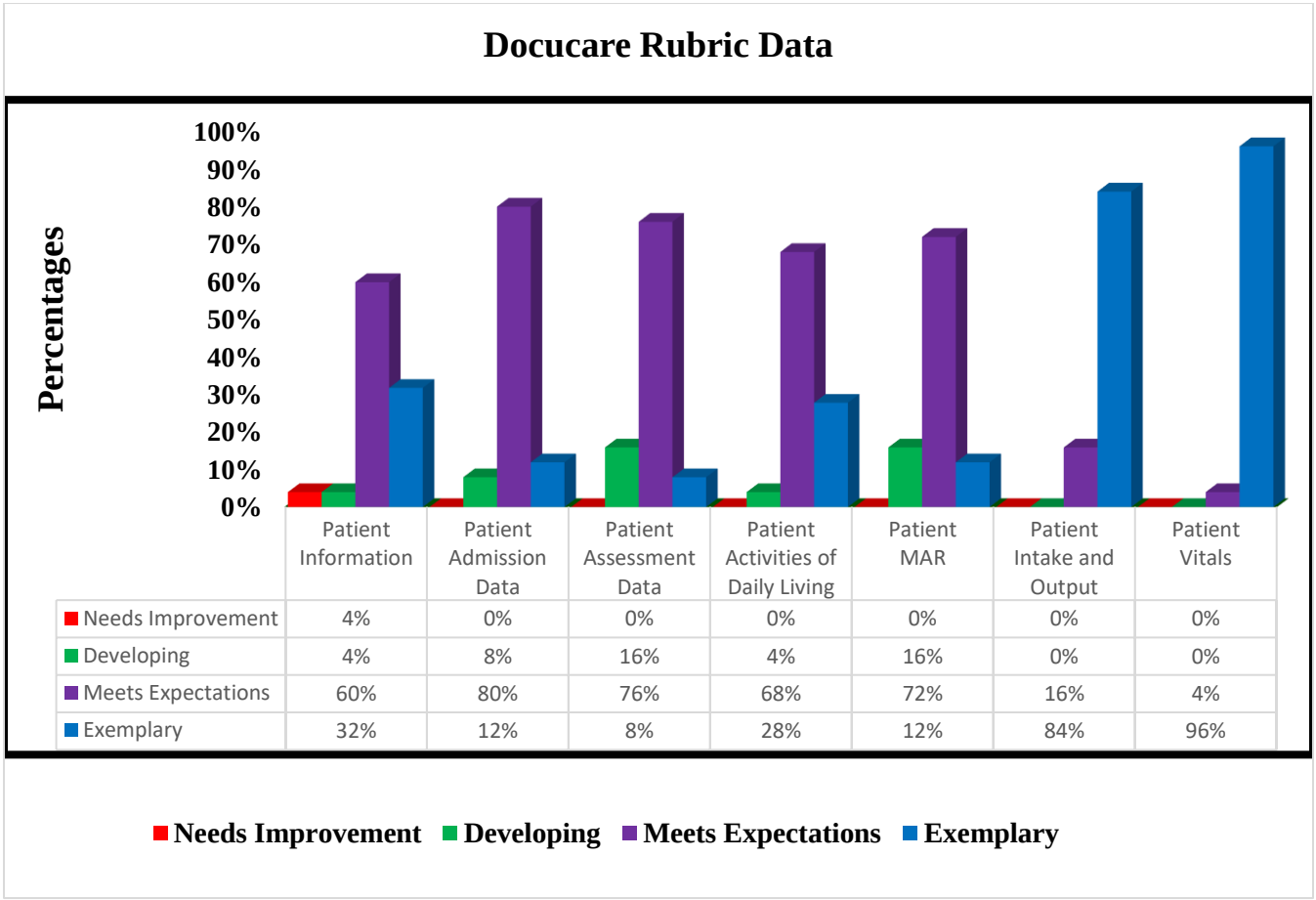
	N	%
Developing	4	16.0%
Meets expectations	18	72.0%
Exemplary	3	12.0%

Docucare patient intake and output

	N	%
Meets expectations	4	16.0%
Exemplary	21	84.0%

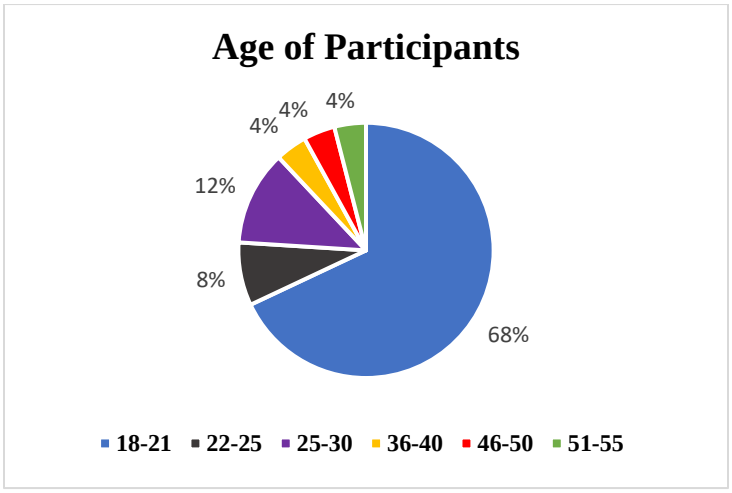
Docucare patient vitals

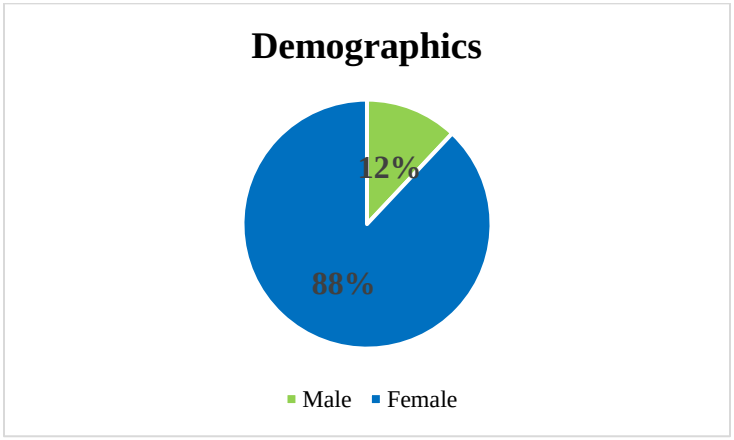
	N	%
Meets expectations	1	4.0%
Exemplary	24	96.0%

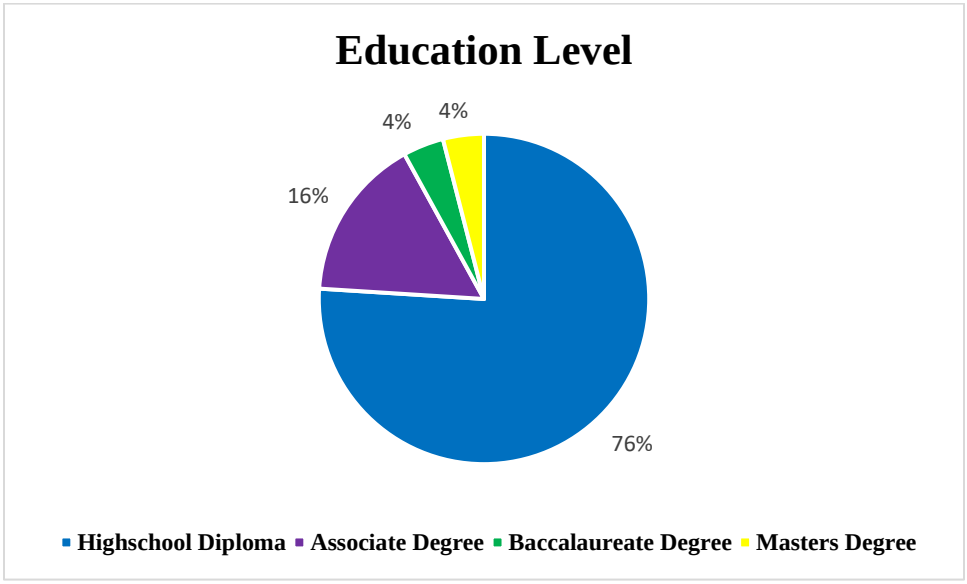


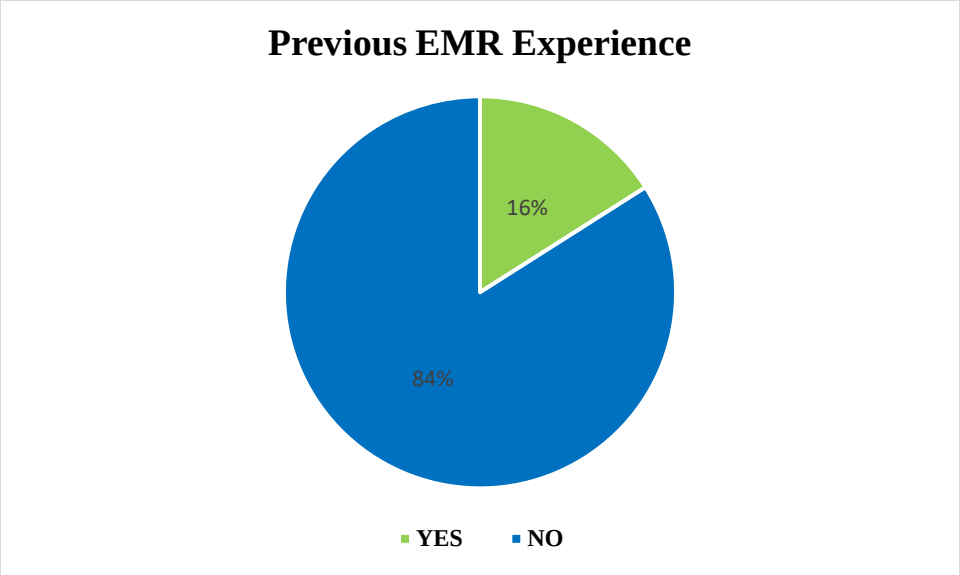
Appendix F

Demographic Statistics








Previous EMR Experience
16%
84%
YES
NO

Appendix G

EMR Competency in First Year Nursing Students Logic Model

Clinical Question: **Can education improve EMR competency during simulation by 50% among first year nursing students?**

Objectives	**Outputs**		**Outcomes -- Impact**		
	Activities	*Resources*	*Short*	*Medium*	*Long*
1. Improve EMR Competency in First Year Nursing Students 2. Improve new nursing graduates' documentation quality while caring for patients at bedside. 3. Improve documentation in academic electronic medical record	1. First year nursing students will be trained on electronic documentation 2. First year nursing students will participate in simulation experience while documenting in an academic electronic medical record. 3. First year nursing students will pass EMR competency after simulation experience & training.	1. Nursing faculty 2. First year nursing students 3. Technology Professionals 4. Academic Electronic Medical Record 5. Simulation Room with technology/ computer 6. Competency form	1. Introduce students to an academic electronic medical record 2. Offer training video to nursing students and participate in simulation experience 3. Utilize competency form developed by Lippincott with each student	1. Nursing student will document in appropriate areas of EMR 2. Nursing student will participate in simulation after EMR training & feel confident performing patient care & simultaneously documenting. 3. Nursing student will pass EMR competency	1. Improve confidence in newly graduated nursing student as it relates to EMR documentation. 2. Improve workforce EMR competency for nursing graduates. 3. Improve the skill of performing patient care while simultaneously documenting in EMR.

Assumptions

1.After academic EMR training provided, it is expected the first-year nursing student will have improved competency level with electronic documentation.
2. After competency levels show improvements, it is assumed other nursing faculty will utilize EMR competency forms for first year nursing students within various programs.
3. It is assumed that newly graduated nurses will demonstrate improvements in electronic documentation utilizing a work based EMR.
4. It is assumed that improved competency levels will overall have a significant impact on improving quality patient care, decreasing costs, and improved patient outcomes.

DNP PROJECT 2020-2021
Laura Kim Gosa

Appendix H: *TIGER-based -Assessment of Nursing Informatics Competencies© (TANIC©)*

Dear first-year student nurse,

Thank you for your participation in the quality improvement project to determine competency of electronic documentation. The below test will consist of easy statements on your level of comfort with each skill. Please circle which level best pertains to you.

Age

- 18-21
- 22-25
- 25-30
- 31-35
- 36-40
- 41-45
- 46-50
- 51-55
- 56 or older

Gender

- Male
- Female

Highest Education Preparation

- Highschool
- Associate Degree
- Baccalaureate Degree
- Master's Degree
- Doctoral Degree

Previous Electronic Medical Record Experience?

- Yes
- No

	Expert	Proficient	Comfortable	Beginner/ NA
Describe the concepts of uploading and downloading	❑	❑	❑	❑
Activate a hyperlink	❑	❑	❑	❑
Define the term e-learning	❑	❑	❑	❑
Name options for recycling computer components, printer cartridges and paper	❑	❑	❑	❑
Name ways to protect my computer and information	❑	❑	❑	❑
Start the computer and log on securely using a username and password	❑	❑	❑	❑
Restart the computer using an appropriate routine	❑	❑	❑	❑
Shut down a non-responding application	❑	❑	❑	❑
Shut down the computer using an appropriate routine	❑	❑	❑	❑
Use available Help functions	❑	❑	❑	❑

View the computer's basic system information	❑	❑	❑	❑
Create a desktop icon	❑	❑	❑	❑
Collapse, expand, restore, re-size, move, close a window	❑	❑	❑	❑
Create a folder and sub-folder	❑	❑	❑	❑
Identify common file types	❑	❑	❑	❑
Use a text editing application	❑	❑	❑	❑
Sort files	❑	❑	❑	❑
Rename files, folders	❑	❑	❑	❑
Move files, folders between folders and between drives	❑	❑	❑	❑
Restore files, folders from the recycle bin/wastebasket/trash	❑	❑	❑	❑
Use anti-virus software to scan specific drives, folders, files	❑	❑	❑	❑
Change the default printer from an installed-printer list	❑	❑	❑	❑

Open an application	❑	❑	❑	❑
Create a new file	❑	❑	❑	❑
Save a file to a location on a drive	❑	❑	❑	❑
Close an application	❑	❑	❑	❑
Open a file	❑	❑	❑	❑
Close a file	❑	❑	❑	❑
Switch between open files	❑	❑	❑	❑
Copy and paste content between files	❑	❑	❑	❑
Display/ hide built-in toolbars	❑	❑	❑	❑
Identify risks associated with being online	❑	❑	❑	❑
Display a web page in a new window, tab.	❑	❑	❑	❑
Discuss the main benefits of instant messaging	❑	❑	❑	❑
Recognize examples of social networking websites, Internet forums, chat rooms, on-line computer games	❑	❑	❑	❑

Recognize attempted phishing	❑	❑	❑	❑
Explain the importance of network etiquette (netiquette)	❑	❑	❑	❑
Identify possible problems when sending file attachments	❑	❑	❑	❑
Complete the To, Copy (Cc), Blind copy (Bcc), and subject fields in email	❑	❑	❑	❑
Insert, remove a file attachment	❑	❑	❑	❑
Save a draft of an e-mail	❑	❑	❑	❑
Use a spell-checking tool and correct spelling errors	❑	❑	❑	❑
Send an e-mail; send an e-mail with a low, high priority.	❑	❑	❑	❑
Use the reply, reply to all function	❑	❑	❑	❑
Forward an e-mail	❑	❑	❑	❑

Add, remove message inbox headings like: sender, subject, date received	❑	❑	❑	❑
Apply a setting to reply with, without original message insertion	❑	❑	❑	❑
Flag an e-mail. Remove a flag mark from an e-mail	❑	❑	❑	❑
Identify an e-mail as read, unread. Mark an e-mail as unread, read	❑	❑	❑	❑
Search for an e-mail by sender, subject, e-mail content	❑	❑	❑	❑
Add contact details to an address book. Delete contact details from an address book	❑	❑	❑	❑

	Expert	Proficient	Comfortable	Beginner/NA
Capture data and information related to clinical care	❑	❑	❑	❑
Update data and information	❑	❑	❑	❑
Display on a screen	❑	❑	❑	❑
Print standardized (pre-formatted) reports	❑	❑	❑	❑
Demonstrate procedures that assure confidentiality of protected patient health information (PHI)	❑	❑	❑	❑
Demonstrate procedures for maintaining security of PHI	❑	❑	❑	❑
Demonstrate procedures to maintain security of organizational information	❑	❑	❑	❑

Find information stored in the HIS to guide patient care (guidelines, standardized plans of care, protocols, etc.)	❑	❑	❑	❑
Communicate electronically with others such as colleagues, patients, other departments, and organizational units	❑	❑	❑	❑

Appendix I

Docucare Rubric Tool

Student Name:_____

	3	2	1	0	NA	POINTS
Patient Information: Patient initials, clinical descriptor, admission date & time, gender, age group, culture, ethnicity, marital status, admit diagnosis, isolation status, code status, other	All documented areas 100% complete and provide thorough information. No HIPPA violations.	Asterisked areas documented. Missing one of the following areas: culture, ethnicity, marital status, code status, isolation status. No HIPPA violations.	Missing two or more of the following areas: culture, ethnicity, marital status, code status, isolation status. No HIPPA violations.	HIPPA violation present by utilizing patient's first and last name instead of initials.	Not applicable to the clinical event.	
Comments:						
	3	2	1	0	NA	POINTS
Admission: History of chief complaint, review of system, family history, past medical history, social history, allergies, immunizations, other	Admission assessment, review of systems, family history, past medical history, social history, allergies, and immunizations complete. All documented areas 100% complete and provide thorough information.	Completed three of the admission assessment areas thoroughly OR all documented areas 75% complete.	Completed less than three of the admission assessment areas thorough OR all documented areas are 50% complete.	Admission areas are not completed or present in the electronic health record.	Not applicable to the clinical event	
Comments:						
	3	2	1	0	NA	POINTS
Assessments: Shift head-to-toe, focused assessments, Braden scale, other	All body systems documented for the shift head-to-toe assessment. 100% of each assessment or focused assessment completed with thorough, relevant information.	Completed at least three body systems for the shift head-to-toe. Assessment area or focused assessments 75% complete.	Completed less than three body systems for the shift head-to-toe, focused assessment areas less than 50% complete.	No focused assessment present in the electronic health record. No shift head-to-toe present in the electronic health record.	Not applicable to the clinical event.	
Comments:						
	3	2	1	0	NA	POINTS

Clinical Documentation

Activities of Daily Living: Assessment of mobility, gait, transfer, assisted devices, Morse Fall Risk	Thorough and detailed ADL assessment present. Morse Fall Risk scale 100% completed. More than three Morse Fall Risk plan nursing interventions present. Interventions are thorough and relevant to the patient situation.	ADL assessment and/or Morse Fall Risk 75% complete. Three interventions provided in the Morse Fall Risk assessment plan.	ADL assessment and/or Morse Fall Risk less than 50% complete. No interventions/plan provided in Morse Fall Risk assessment plan.	No Morse Fall Risk completed. No assessment of ADL's present in the electronic health record.	Not applicable to the clinical event.	
Comments:						

	3	2	1	0	NA	POINTS
Notes: Nursing Note – event, admission, discharge, alert family, alert healthcare provider, transfer, disruptive patient, other	Required nursing note format present. 100% of the information needed for type of nursing note present. Information is concise, thorough, no spelling errors.	Nursing note format present in note. Nursing note has 75% of information needed for type of nursing note present. 1-2 misspelled words present in the note.	Nursing note format not followed. Missing over 50% of needed information for the type of specific nursing note utilized. More than 2 misspelled words present in note.	No nursing notes related to the clinical present in the electronic health record.	Not applicable to the clinical event.	
Comments:						

	3	2	1	0	NA	POINTS
Nursing Care Plan: Prioritized nursing diagnosis, patient outcomes/goals, independent nursing interventions, collaborative interventions, evaluation	Nursing Care Plan utilizes relevant nursing diagnosis. Contains: "related to" and "as evident by" statements, patient outcomes, independent and collaborative nursing interventions, evaluative data, rationale and references for all interventions cited correctly.	Three categories of the nursing care plan completed. Nursing diagnosis utilized is relevant to the patient situation. Three interventions contain rationale and reference materials cited correctly.	Less than three categories of the nursing care plan completed. Irrelevant nursing diagnosis utilized. Less than three rationale present for interventions. References cited incorrectly.	No evaluation of established nursing diagnosis. No nursing plan of care present in the electronic health record. No rationale present for nursing interventions. No reference citation present.	Not applicable to the clinical event.	
Comments:						

	3	2	1	0	NA	POINTS
Orders: New orders received during shift, new medications administered	100% of new orders from clinical day are present in the electronic health record. Orders contain all elements needed for them to be considered valid.	75% of new orders from the clinical day are present in the electronic health record. All elements needed for an order to be valid are present.	Less than 50% of new orders from the clinical day are present in the electronic health record. Less than three of the elements needed for an order to be valid.	New orders received during clinical not present in the electronic health record.	Not applicable to the clinical event.	
Comments:						

	3	2	1	0	NA	POINTS

Clinical Documentation

Medication Administration Record: Home medication list, medications administered in the clinical setting	100% of medications administered during clinical present on the MAR. All home medications for the patient listed in the electronic health record.	75% of the medications administered during clinical are present on the MAR. 75% of the home medications are listed in the electronic health record.	Less than 50% of the medications administered during clinical are present on the MAR. No home medication list present in the electronic health record.	No record of medications being administered in the electronic health record.	Not applicable to the clinical event.	
Comments:						

Clinical Documentation

	3	2	1	0	NA	POINTS
Intake/Output: Intake oral, parenteral, enteral, irrigation Output body fluids, irrigation	100% of all sources of intake andoutput documented in the electronic health record. All documentation areas completed for each intake and output entry.	75% of all sources of intake and output are documented. Three documentation areas completed for each entry.	Entries for all sources of intake and output incomplete.Less than three documentation areas completed for each entry.	No record of sources of intake or output present inthe electronic health record.	Not applicableto the clinical event.	
Comments:						
	3	2	1	0	NA	POINTS
Vital Signs: Temperature, temperature source, blood pressure, location for blood pressure, heart rate, respiratory rate, pulse oximeter, oxygen use, oxygen source, oxygen percentage, weight, weight source, glucose readings, last meal, interventions	All vital sign components presentin the electronic health record and documented correctly. Glucose results have actions and“last ate” information present.	Three vital sign componentsdocumented correctly and present in the electronic health record.	Less than three vital sign components correctly documented or present in theelectronic health record.	No vital signs data presentin the electronic health record.	Not applicableto the clinical event.	
Comments:						
				TOTAL POINTS		