Standardized Code Blue Process

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Abstract

Cardiac arrest remains an increasing health problem, leading to thousands of cardiopulmonary resuscitation attempts annually. With variations in code blue documentation and post-event team debriefings, a standardized process review promotes enculturation of employee expectations and improves patient outcomes. The purpose of the DNP evidence-based practice quality improvement (EBPQI) project was to standardize the code blue event processes at the Veteran's Health Care System of the Ozarks (VHSO), specifically event documentation and leader-driven team debriefing. Data was analyzed using a descriptive approach. A one-way ANOVA was used along with testing of homogeneity of variances to understand whether there was a significant difference ($p<.05$) between the pre- and post-implementation variables. The analysis also determined the significance of self-efficacy performance among nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors. Pre-implementation retrospective chart reviews identified 122 code blue events with 79 inaccuracies of missing rhythm strips, missing documentation, and/or no post event debriefing (35% compliance). Post-implementation chart reviews identified nine code blue events with one inaccuracy of no post event debriefing (89% compliance). Pre- and post-implementation quantitative nursing surveys were delivered to participants through a simple convenience sampling method. Results suggest statistical significance between the pre- and post-implementation participants for the self-efficacy questions ($p \leq .001$).

Keywords: cardiac arrest, code blue, standardization of care (standardized process review), code blue documentation, code blue debriefing

Standardized Code Blue Process

The American Heart Association (AHA, 2017b) reported the adult survival rate for in-hospital cardiac arrest events as 24.8% in 2016. Cardiac arrest refers to an electrical malfunction within the heart, causing an arrhythmia (AHA, 2016). When the pumping action of the heart is disrupted due to the electrical malfunction, blood flow is impeded to the brain, lungs, and eventually other bodily organs (AHA, 2016). This leads to unconsciousness and no pulse, termed cardiac arrest. Within the Veteran's Health Administration (VHA) facilities, the term code blue is used for cardiopulmonary arrest emergencies (Department of Veterans Affairs, Office of Inspector General [OIG], 2015b).

While the AHA provides structured adult advanced cardiac life support (ACLS) and basic life support (BLS) programs for health care professionals, missing documentation and poor team dynamics following code blue events in the hospital setting suggest an opportunity for improvement (Alspach, 2015; O'Donoghue et al., 2015). This is true for the Veteran's Health Care System of the Ozarks (VHSO) setting, which is part of the Veterans Integrated Service Network (VISN) 16. A preliminary review of VHSO's code blue flow sheet within the electronic medical record, or Computerized Patient Record System (CPRS), indicated documentation errors (missing code strips and incorrect documentation of airway/ventilation and circulation), and inconsistent debriefing following code blue events. This information is referenced in VHSO's Office of Quality, Safety, and Value; the Peer Review committee; and Intensive Care Unit (ICU) committee meeting minutes from August 2017 to December 2017.

Background and Significance

The incidence of cardiac arrest remains a health problem in the United States, affecting thousands of individuals in both in-hospital and out-of-hospital settings every year (Merchant et

al., 2011; Sutton, Nadkami, & Abellas, 2012). Recent data reports approximately 209,000 cardiac arrests occurred in the hospital setting in 2013 (AHA, 2013). There is a moderate positive relationship (r = .60) between high quality cardiopulmonary resuscitation and decreased mortality following cardiac arrest (Meaney et al., 2013). This correlation can be attributed to the education and hands-on training developed by the AHA (2017c).

The AHA provides health care professionals with the skills necessary to respond in the event of a code blue. Currently, VHSO is one of the pilot sites in the U.S. for the AHA's (2017c) resuscitation quality improvement program that is aimed at replacing the standard classroom check-off, which is conducted every two years, with quarterly, hands-on mobile simulations and computerized questionnaires of BLS and ACLS cases. With quarterly check-offs in the resuscitation quality improvement program, one's expiration date for course completion of basic life support (BLS) and advance cardiac life support (ACLS) is extended by three months. BLS and ACLS course completion cards will eventually be phased out, leading to online verification of completion (AHA, 2017c). The VHSO's Nursing Clinical Support has taken the lead in implementing the resuscitation quality improvement program initiative component, thus is not a component of the project.

Local Issue

While positive outcomes for code blue events are reported regarding high, quality cardiopulmonary resuscitation, there may be variations in the implementation and monitoring of quality improvement initiatives focused on team debriefings and process review of code blue documentation (Meaney et al., 2013). Pre-implementation evaluation of the code blue processes at VHSO and code blue flow sheet in the electronic medical record, suggests 65% of the events are missing portions of documentation or are incorrectly documented, and team debriefing

sessions are not consistently conducted and led by the Nurse Manager or Off-tour Nursing Coordinator/Supervisor per policy. This data reflects the review of 122 code blue events at VHSO between October 1, 2011 and December 31, 2017. Forty-one of the 122 events (34%) resulted in the Veteran not surviving following cardiac arrest.

Diversity Considerations

VHSO is located in the southern portion of Northwest Arkansas which is in Washington County. Northwest Arkansas is culturally diverse, primarily because of the presence of various major corporations. Like many other Veteran Health Care Systems, VHSO serves a culturally diverse population of Veterans from various war eras (Department of Veterans Affairs, 2018a). Similarly, VHSO promotes a culturally diverse work environment that fosters employee engagement and empowerment (Department of Veterans Affairs, 2018b).

Clinical Problem and Purpose

Data from the initial retrospective chart review of code blue events revealed a high margin of variability in the documentation and follow up to the events. In addition to concerns discussed during Office of Quality, Safety, and Value; Peer Review; and ICU committee briefings, VHSO's executive administration that is known as the Pentad and the Nursing Clinical Support have indicated Veteran outcomes and performance improvement measures could be compromised without corrective action. The current practice was not within the parameters of a best practice within the Veteran's health care system. The purpose of the EBPQI project was to determine if standardizing code blue processes at VHSO, based on the hospital's standard operating protocol/procedure and medical center memorandum regarding code blue events, decreased code blue documentation issues and improved leader-driven team debriefing. Cost figures factored in the amount the student investigator and key stakeholders would be

compensated, according to salaries. The cost for an upgraded Survey Monkey account, paper, and printing was self-funded. Conference dissemination was funded through the VA.

Facilitators and Barriers

Major facilitators and contributors to the DNP EBPQI project were the ICU committee, Office of Office of Quality, Safety, and Value; Peer Review committee; Nursing; and Nursing Clinical Support. Three major barriers were identified. First, there were conflicting ideas among key stakeholders about what was the most appropriate standardized process for improving code blue documentation and leader-driven team debriefings. Second, VHSO represented a small clinical setting compared to other VHA medical centers. Third, the process for change in the Veteran health care system may have taken longer compared to civilian health care settings.

Review of the Evidence

The benefits of implementing a standardized process for code blue events, educational debriefings, documentation and self-efficacy performance attribute to improved patient outcomes and the facilitation of high-performing teams (Couper et al., 2016; Rivera-Chiauzzi, Lee, & Goffman, 2016; Sunde et al., 2007). The doctoral EBPQI project promotes enculturation of clinical expectations and requirements lending to assimilation into practice based on VHSO's institutional values.

Inquiry

The following question was posed based on the clinical problem: For Nurse Managers and Off-tour Nurse Coordinators/Supervisors, does implementation of a standardized process for code blue events versus the current practice of no standardized process improve code blue documentation and leader-driven post event debriefing in 6 months at the Veteran's Health Care System of the Ozarks?

Search Strategies

Upon reviewing Standard Operating Protocol/Procedures, Medical Center Memorandums, and ACLS protocols for code blue performance at VHSO, minimal information was identified regarding a standardized process with the inclusion of code blue documentation and leader-driven post event team debriefings. A search of the literature was conducted using CINAHL, Cochrane, and PubMed. Keywords used in the initial search included cardiac arrest, code blue, cardiopulmonary resuscitation, post arrest care, code blue debriefing, post arrest debriefing, clinical documentation, cardiac arrest documentation, standardization of care, standardized process review for cardiac arrest, crisis resource management, self-efficacy, evidence-based practice, quality performance improvement, Fisher's exact testing, nursing models, nursing theory, self-efficacy theory, social science theory, Kotter's theory, nursing management theory, and structural organizational theory.

The search of literature for these keywords yielded over 30,000 results. Results were narrowed based on year range of publication (2007-2017), availability of full text, and qualitative or quantitative studies. Articles and studies chosen for concentration were related to cardiac arrest resuscitation practice; code blue debriefing, documentation, and self-efficacy performance; standardization of care and process review; and self-efficacy and nursing management (see Appendix A for a list of defined terms). Exclusion criteria included unpublished studies and reports, and studies not related to the four themes identified within the synthesis of evidence.

Search Results Study Design and Level of Evidence

Search results were further narrowed by focusing on specific sub-topic areas. The following identifies the design and level of evidence for 20 studies based on Melnyk and Fineout-Overholt's (2015, adapted) system of the hierarchy of evidence for interventional inquiry: one systematic review with meta-analysis (quantitative), Level I; one systematic review without meta-analysis (quantitative), Level I; one meta-analysis of a randomized controlled trial, Level I; one evidence-based practice guideline based on a systematic review, Level I; two randomized controlled studies/trials, Level II; one controlled trial without randomization, Level III; one systematic review of a correlational study, Level III; four controlled cohort studies, Level IV; one cross-sectional study, Level IV; three systematic reviews with meta-analysis (qualitative), Level V; two systematic reviews without meta-analysis (qualitative), Level V; and two evidence-based practice guidelines from authorities, Level VII (see Appendix B for the hierarchy of evidence).

Synthesis of Evidence

While there were varying levels of evidence for standardized code blue processes, it was important to identify the positive relationship between standardized processes for cardiac resuscitation care, team debriefings, documentation, and self-efficacy performance during code blue events (Couper et al., 2016; Rivera-Chiauzzi et al., 2016; Sunde et al., 2007). The mortality rate for code blue events at VHSO for the period of October 1, 2011 to December 31, 2017 was 34%. This percentage was below the national benchmark standard, thus did not suggest a large margin of human error. Nevertheless, setting a standard for accountability and compliance in practice could be argued as influential toward best outcomes for Veterans (Department of Veterans Affairs, OIG, 2015a).

The synthesis and integration of evidence is presented on each sub-topic. The evidence sub-topics related to the inquiry are *standardization of care and process review*; *code blue debriefing, documentation, and self-efficacy performance*; *self-efficacy and nursing management*; and *cardiac arrest resuscitation practice* (see Appendix C for the evidence table).

Standardization of Care and Process Review

Standardization is a comprehensive process agreed upon and implemented by key stakeholders to improve overall organization and patient outcomes (Leotsakos et al., 2014). Specifically, standardization of care accounts for the specifications, criteria, methods, processes, designs, and practices used when implementing best practices focused on safety, quality, and reduction of variation (Leotsakos et al., 2014, p. 110). In the High 5s project study, Leotsakos et al. (2014) emphasize that implementing standardized operating protocols across hospitals globally can significantly reduce the incidence of hospital-based patient safety issues.

Standardized operating protocols define expectations of health care professionals regarding consistent and measurable patient care processes (Leotsakos et al., 2014; Hagwood, 2017). In addition to enhancing employee confidence levels, there is a positive correlation (r = .70) between standardization and the reduction of risk, health care costs, and workflow inefficiencies (Leotsakos et al., 2014; Hagwood, 2017). Standardization of care and process review promotes learning from others' experiences and familiarity with best practices, lending to the highest level of patient safety (Leotsakos et al., 2014; Hagwood, 2017; O'Donoghue et al., 2015).

Hagwood's (2017) EBP guidelines support the results and discussion proposed by Leotsakos et al. (2014) in that standardization of care is a comprehensive, collaborative approach toward improving performance efficiency. Implementing standardized processes within the work

environment while integrating a culture of safety into the overall mindset of health care professionals can clinically reduce medical errors (Hagwood, 2017; Sunde et al., 2007). For example, standardizing the work environment and operational phases of care promotes a sense of reliability in the process while setting performance expectations for health care professionals.

The EBP guidelines proposed by Hagwood (2017) further suggest utilization of the approaches 3P (production, preparation, and process) as well as 5S (sort, set, shine, standardize, and sustain). This would be most beneficial during the transition planning and operational phases of standardization to ensure sustainability and health care quality improvement (Hagwood, 2017). The guidelines stress standardized health care processes should be designed with daily activities, interdisciplinary involvement, and pathways of care in mind to avoid waste and variability (Hagwood, 2017).

As standardization of care processes were developed and implemented into practice at VHSO, situational events that occurred at other health care facilities, which led to more standardized protocols, methods, and checklists were considered by the improvement team. For instance, the code blue processes at one VA health care facility in California warranted questioning and investigation by the OIG due to a lack of standardization and employee support by nursing leadership (Department of Veteran Affairs, OIG, 2015b). Following the death of one Veteran after a code blue event, discrepancies and issues were identified regarding standardized airway management, advanced care planning, code status, and Veteran identification (Department of Veteran Affairs, OIG, 2015b).

Although ACLS and BLS guidelines are in place to facilitate standardization of care and processes for cardiac arrest events, there continues to be a disconnect in performance expectations. Standardized processes for code blue communication, performance,

documentation, and debriefing has become essential in best practice models (Department of Veterans Affairs, OIG, 2015b; O'Donoghue et al., 2015; Hunziker et al., 2011). A positive correlation (r = .63) exists between standardized code blue processes and high-performing teams, strong team leaders/nurse managers, consistent training, and nurse knowledge/skill level which may be contributing factors to consider in implementation of evidence (O'Donoghue et al., 2015; Hunziker et al., 2011).

Standardization of care processes were further supported by VHA's quality enhancement research initiative (QUERI) and Office of Quality, Safety, and Value. The EBP guidelines support innovative integration of health care services through research, policy, and standardized clinical pathway care aimed at improving quality outcomes (McQueen, Mittman, & Demakis, 2004). The development of a standardized code blue process applies quality improvement methods, while factoring in the behavioral change needed for successful implementation within the VA health care setting (McQueen et al., 2004; Sunde et al., 2007).

Code Blue Debriefing, Documentation, and Self-Efficacy Performance

Missing or incomplete code blue documentation as well as inconsistent team debriefings led by a Nurse Manager or Off-tour Nurse Coordinator/Supervisor created concerns for key stakeholders at VHSO. Variability with these components elevated the implementation of evidence as a priority to ensure Veteran outcomes were not compromised, while clearly identifying clinical expectations and requirements. The benefits of implementing standardized code blue documentation and educational debriefings led by a nurse leader were supported by current evidence.

Cardiac arrest educational debriefing has been discussed throughout literature as a factor toward improving overall CPR quality and patient outcomes (Couper et al., 2016). Hospital

survival, neurological outcomes at discharge, and chest compression depth are a couple performance measures currently reviewed regarding overall quality and effectiveness of consistent team debriefings (Couper et al., 2016). Individual debriefing sessions within four days of a code blue event and/or monthly group debriefings with the health care professionals involved were considered as an option when developing the criteria for the nurse leaders at VHSO (Couper et al., 2016). According to Couper et al. (2016), there is a positive correlation (r = .72) with overall team debriefing and confidence level in responding to future code blue events when the debriefing session is offered within the week following an event as well as again within the same month as a case study.

There was further evidence to suggest a direct relationship between standardized processes for code blue team debriefing sessions and improved patient outcomes. Variability in cardiac arrest survival has been correlated (r = .80) to poor resuscitation performance, distractions during a code blue event, and lack of feedback following these events (Sutton et al., 2012). Quantitative monitoring, structured debriefing, and clear documentation of code blue events were recommended to improve health care professional compliance (Sutton et al., 2012).

Comparisons of clinical documentation were made by Sukul et al. (2017), which could be considered for evidence implementation when developing the standardized code blue flow sheet. Similar to the situation at VHSO, 50% of the cases reviewed by Sukul et al. (2017) identified missing or incorrect code blue documentation. Details of the retrospective code blue events at VHSO were documented in various notes within CPRS rather than the designated flow sheet, which posed challenges for the reviewer. Evidence suggests standardized code blue documentation can positively impact transitions of patient care (Sukul et al., 2017).

Self-Efficacy and Nursing Management

Considering the role of the Nurse Manger and off-tour Nurse Coordinator/Supervisor in the code blue process, self-efficacy in crisis resource and nursing management was reviewed. Theory analysis of interviews and focus groups were used to define the communication often observed during code blue events, as well as the roles of an event manager and nurse leader in these cases (Taylor, Parshuram, Ferri, and Mema, 2017). Approximately 44% of communication during a code blue event regarding resuscitation is driven by health care professionals other than the team leader (Taylor et al., 2017). This outer-loop communication could lead to role confusion, thus an important consideration in implementing the evidence. Likewise, it was appropriate to evaluate the use of both an event manager and Nurse Manager and/or Off-tour Nurse Coordinator/Supervisor during code blue events to provide direction and facilitation (Taylor et al., 2017).

Although the validity of crisis resource management training has been questioned in the literature, Castelao et al. (2015) made a compelling case for the training. Code blue teams composed of one crisis resource management team leader and three ACLS trained team members yielded a higher, positive correlation (r = .87) to response and competency in code blue scenarios compared to teams with a non-crisis resource management trained team leader (r = .63) (Castelao et al., 2015). One could infer specific crisis resource management training for leaders, specifically those leaders with high self-efficacy, improves overall team performance as well as adherence with standardized guidelines for code blue event processes (Castelao et al., 2015; Taylor et al., 2017).

Acknowledging the relevancy of self-efficacy as briefly discussed by Castelao et al., (2015), additional review in the literature and studies was warranted to address evidence

associated with the inquiry. Self-efficacy refers to an individual's ability to effectively perform a task within the work environment or specific situation, which can be a predictor of one's satisfaction and performance (Gilmartin & Nokes, 2015). Remaining mindful of this is important when evaluating a nurse's or other health care professional's ability to perform effectively in a new specialty area or during organizational and leadership change (Gilmartin & Nokes, 2015). An individual's self-efficacy may be influenced by the difficulty level of a task; certainty in completing the task based on this level of difficulty; and the extent of difficulty in completing the task based on the scenario (Gilmartin & Nokes, 2015).

One could infer a nurse's competency and ability to respond to a clinical situation were derived from professional experience and effective clinical decision-making (Gilmartin & Nokes, 2015). There is a positive correlation (r = .70) between high self-efficacy and effective nursing leadership during stressful clinical situations (Gilmartin & Nokes, 2015). Specifically, nurse leaders who report high self-efficacy also report strong self-confidence as a nurse leader for direct care nurses, positive job satisfaction, and competency in facilitating evidence-based clinical processes (Gilmartin & Nokes, 2015). In addition, Gilmartin and Nokes (2015) focused on the clinical nurse leader (CNL) role regarding self-efficacy and nursing leadership change.

Based on the evidence inquiry, there was a connection between code blue events, crisis resource management, and self-efficacy. Plant et al. (2011) discuss self-efficacy as a vital component to resuscitation performance and that it is instrumental in the development of crisis resource management skills for all health care professionals. Because of challenges identified when assessing employee crisis resource management skills during code blue events, Plant et al. (2011) developed an instrument to measure self-efficacy with these skills. Crisis resource management skills were identified as the behavioral skills needed to manage a code blue event

and measured through a 5-point Likert rating scale (Plant et al., 2011). Clinical decision-making and awareness, leadership, communication, and collaborative teamwork were also addressed (Plant et al., 2011). Findings suggest a positive relationship (r = .89) between self-efficacy and performance during a code blue event, as well as theoretical importance of self-efficacy in ongoing cardiac arrest training (Plant et al., 2011).

Additional studies have evaluated the premise of Bandura's self-efficacy theory to identify learning activities, develop performance improvement activities, and assess nurse leaders' and direct care nurses' self-efficacy with clinical competencies and situations (Bandura et al., 1989; Gilmartin and Nokes, 2015; Kennedy, Murphy, Misener, & Alder, 2015). Bandura et al. (1989) specifically tested and compared the influence of an individual's self-efficacy level on organizational controllability and performance, performance standards, and the ability to mediate self-regulatory determinants, suggesting employee training on the subject matter enhances management skills and performance. The framework for self-efficacy could enhance the development of standardized code blue processes, documentation, and leader-driven team debriefings by Nurse Managers and Off-tour Nurse Coordinators/Supervisors.

Organizational and leadership practice changes were also probable in this process. Considering this, it is essential for organizations to adjust to expected change by becoming and remaining more cognizant of the psychological aspects of change (Straatmann, Kohnke, Hattrup, and Muellen, 2016). Recent evidence suggested a 70-80% failure rate for organizational and behavioral change among organizations (Appelbaum, Habashy, Malo, & Shafiq, 2012; Straatman et al., 2016). The data was concerning to application of the evidence because VHSO, like other health care facilities, is faced with continual organizational change. Hence, the development and implementation of new standardized initiatives became more of a priority. Appelbaum et al.

(2012) elaborate on organizational and behavioral change theory through review of John Kotter's model of change. The eight steps of Kotter's model include 1) establish a sense of urgency, 2) create a guiding coalition, 3) develop a vision and strategy, 4) communicate the change vision, 5) empower broad-based action, 6) generate short-term wins, 7) consolidate gains and produce more change, and 8) anchor new approaches in the corporate culture (Appelbaum et al., 2012, p.765-766).

Cardiac Arrest Resuscitation Practice

Cardiopulmonary arrest is categorized as an emergency, requiring assertive response by health care professionals to implement life-saving skills (AHA, 2017a). While standardized ACLS guidelines are published by the AHA (2016), there is a direct relationship between hospital cardiac arrest event outcomes and variations in cardiopulmonary resuscitation practice. Edelson et al. (2014) conducted a study on cardiac arrest resuscitation practice and determined variables such as teaching status of the hospitals, resuscitation structure and practices, resource availability, and quality improvement practices each influenced health care professional performance. Extensive variability among U.S. hospitals in debriefing, simulation training, documentation, and resuscitation care practices is significant (Edelson et al., 2014; Meaney et al., 2013).

Meaney et al. (2013) further determined there is considerable variation in resuscitation practice, monitoring, and quality improvement during and after cardiac arrest events. This was based on the metrics cardiopulmonary resuscitation performance, monitoring, feedback, high-performing teams, and continuous quality improvement (Meaney et al., 2013). While review of ACLS quality and resuscitation performance has yielded improved outcomes, such as reduction of harm, increased patient safety, and improved patient condition, most health care institutions

do not consistently conduct post code blue debriefings, nor implement standardized code blue checklists, documentation, and monitoring systems (Meaney et al., 2013).

Theory

Two theories resonated with the processes involved for implementation of the evidence. Upon review of the literature and the aim of the project, the theories of self-efficacy (Albert Bandura), as well as organizational and behavioral change (John Kotter's model of change), coincided with the implementation of a standardized process for code blue documentation and leader-driven debriefing. Dr. Albert Bandura's self-efficacy theory was developed from the social cognitive theory and has been used to study and predict behavior change and management within various work environments (Peterson & Bredow, 2013). The social cognitive theory conceptualizes the person, behavior, and environmental interaction known as the triadic reciprocality, which is the foundation for reciprocal determinism (Peterson & Bredow, 2013; Miller, 2010).

Self-efficacy can be defined as an individual's ability to effectively perform a task within the work environment or a specific situation (Gilmartin & Nokes, 2015). Gilmartin and Nokes (2015) suggest self-efficacy can be a predictor of one's satisfaction and performance, which is important when evaluating a nurse's ability to perform effectively in a new specialty area or during organizational and leadership change. Evidence indicates belief in one's self-efficacy may vary according to how difficult the task may be, certainty in completing the task based on the level of difficulty, and the extent of difficulty in completing the task based on the scenario (Gilmartin & Nokes, 2015) (see Appendix D for a concept model of self-efficacy and Appendix E for a diagram of the key constructs for the social cognitive theory).

Kotter's model of change lends itself to ensuring best practices are in place while fostering standardized processes, especially during times of continual organizational change (Appelbaum et al., 2012; Straatmann et al., 2016). Because health care settings and expectations for care continue to evolve, nurse leaders must remain aware of changing work environments and the impact of such on employee performance (see Appendix F for a diagram of Kotter's model of change).

Theory Application

The early self-efficacy research was used in a controlled setting, and deductive reasoning was used as it is based on previous studies conducted (Peterson & Bredow, 2013). Kennedy, Murphy, Misener, & Alder (2015) and Gilmartin and Nokes (2015) evaluated the premise of Bandura's self-efficacy theory to identify learning activities, develop performance improvement activities, and assess nurse leaders' and direct care nurses' self-efficacy with clinical competencies and situations. The frameworks for self-efficacy and Kotter's model of change could lend to the development of standardized code blue processes, documentation, and leader-driven team debriefings by Nurse Managers and off-tour Nurse Coordinators/Supervisors. Quantitative data results would be collected empirically, directly related to the concepts of self-efficacy and outcome expectations. The frameworks for self-efficacy theory and Kotter's model of change have been adapted and used in nursing research for various interventions, and therefore, are predictive and were used to explain individual responses to an intervention in a clinical setting (Peterson & Bredow, 2013).

Methods

Prior to conducting the initial retrospective chart review of code blue events from October 1, 2011 to December 31, 2017, the student investigator received approval from the

hospital's local Research and Development (R&D) Committee and IRB subcommittee, both located in Fayetteville, Arkansas, as well as the Central Arkansas Veteran's Healthcare System (CAVHS) IRB located in Little Rock, Arkansas. Each of those entities deemed the project as non-research, evidence-based practice in February 2018, with no further Veteran's Health Care System IRB submissions required moving forward with the project. Due to the non-research determination from the R&D Committee, IRB subcommittee and CAVHS IRB, the University of Missouri-Kansas City IRB was not involved (see Appendix G, H and I for the letters from the R&D Committee, IRB subcommittee and CAVHS indicating IRB process and determination). In addition to IRB approval, the student investigator received approval from the American Federation of Government Employees (AFGE), the VA union, to conduct the pre- and post-implementation quantitative study and surveys. This approval was also received in February 2018. The EBPQI project may be shared with other Veteran health care organization, civilian health care organizations, and the public domain based on the approval received from R&D Committee, IRB subcommittee, and CAVHS IRB.

Ethical Considerations and IRB Approval

Evidence and research-based initiatives should always factor in the ethical components of planning, conducting data retrieval, and reporting results (Kalichman, 2009). Nurses and other health care providers have a responsibility to protect the interest of patients, the public, and researchers (Kalichman, 2009). Considering the nature of privacy, protection, and confidentiality, the student investigator completed CITI training for *VA Human Subjects Protection (Stage 1 Basic Course)* and *VA Human Subjects Protection and Good Clinical Practices (Stage 1 Basic Course)*. In addition, the student investigator completed the courses of *VA Privacy and HIPAA Training* and *VA Privacy and Information Security Awareness and Rules*

of Behavior. While the project was determined as noninvasive, non-research, evidence-based by the R&D Committee, IRB subcommittee, and the CAVHS IRB, the student investigator monitored for conflicts of interests and ethical dilemmas. The pre- and post-implementation quantitative nursing surveys were voluntary and anonymous.

Funding

Funding for the project was allocated through self and VHSO (see Appendix J for the budget, funding, and cost table). While the end total was significant, the figures factored in the amount the student investigator and key stakeholders would be compensated according to salaries. Again, the cost for an upgraded Survey Monkey account, paper, and printing was self-funded.

Setting and Participants

The setting for the project took place at VHSO located in Fayetteville, Arkansas. The student investigator identified 122 code blue events at VHSO from October 1, 2011 to December 31, 2017 following an initial retrospective (observational) chart review. The pre- and post-implementation quantitative nursing surveys were delivered to at least 100 Nurse Managers, Off-tour Nurse Coordinators/Supervisors, and direct care nurses working on the following units at VHSO: 2A/2B (medical surgical), ICU, Outpatient Surgery, PACU, GI/Endoscopy, OR and the Emergency Department. Direct care nurses working in the inpatient behavioral health unit (1A), Primary Care Clinic, Specialty Clinics, Outpatient Mental Health Clinic, inpatient palliative care unit, and the hospital's Community-Based Outpatient Clinics were excluded in the sample. A second retrospective (observational) chart review was conducted following six months post-implementation of the new, standardized code blue flow sheet and leader-driven team debriefing checklist.

EBP Intervention

The project was led and facilitated by the student investigator with contributions by the facility's ICU Committee; Office of Quality, Safety, and Value; Nursing's Quality Manager; Nursing Clinical Support; and the Peer Review Committee. In addition, the student investigator's mentor for the DNP program, a Doctor of Nursing Practice, guided and made recommendations as the project progressed at VHSO in Fayetteville, Arkansas.

Recruitment. Recruitment of Nurse Managers, Off-tour Nurse Coordinators/Supervisors, and direct care nurses working on units 2A/2B (medical surgical), ICU, Outpatient Surgery, PACU, GI/Endoscopy, OR and the Emergency Department was completed through a simple convenience sampling method. Pre-implementation surveys were distributed to nurses in April 2018. A script for participating in the survey was approved by Nursing Clinical Support and AFGE (see Appendix K for the email correspondence sent to nurses).

Assessment and Intervention. The evidence-based interventions used in standardizing code blue documentation and leader-driven team debriefing at VHSO included developing and implementing a standardized electronic medical record code blue flow sheet note and debriefing checklist to be completed by either a Nurse Manager or Off-tour Nurse Coordinator/Supervisor. Both components are discussed in further detail within the VHSO's existing Standard Operating Protocol/Procedure and Medical Center Memorandum regarding code blue events, as well as added as attachments to these documents but not included in this paper (see Appendix L for the standardized debriefing checklist to be implemented). The cross-sectional pre- and post-implementation quantitative nursing surveys were intended to measure experience, self-efficacy performance, and perspective of educational training. In addition, direct face-to-face education was be provided to direct care nurses regarding the code blue flow sheet template changes and

debriefing checklist. It is expected annual online education on the subject matter will be offered through the Talent Management System (TMS) at VHSO with anticipation of direct care nurses earning 1.0 CEU. The TMS module on the subject matter will become a requirement for all new direct care nurses during orientation, as well as annual competency (see Appendix M for a logic model of the project; Appendix N for the project timeline flow diagram; and Appendix O for the intervention participant flow diagram).

Change Process and EBP Model

Considering the relevancy for the theories of self-efficacy and Kotter's model of change to the project, Rosswurm and Larabee's Model for Evidence-Based Practice Change served as the conceptual framework guiding the project. This conceptual six-step framework was originally referred to as the Model for Change to Evidence-Based Practice but was revised in 2009. The EBP framework is a multidisciplinary approach and factored in variables of organizational and behavioral change when integrating into the clinical care system (Gawlinski & Rutledge, 2008). The revised six-step framework includes 1) assessing the need for change in practice; 2) locating the best evidence to support change; 3) critically analyzing the evidence; 4) designing practice changes; 5) implementing and evaluating practice changes; and 6) integrating and maintaining practice changes within the clinical care setting (Gawlinski & Rutledge, 2008). Internal quality indicators are compared to data from outside of the organization and linked to standard interventions and performance outcomes (Gawlinski & Rutledge, 2008). The project was found to be a sustainable program at VHSO based on training, yearly competencies, and quality monitoring by Office of Quality, Safety, and Value of the standardized code blue flow sheet and debriefing checklists. This sustainability accounted for modifications to the components based on VHSO's needs.

Study Design

The design of the study was multifaceted including (1) a retrospective chart review (observational) conducted to identify triggers for issues with the code blue documentation and leader-driven debriefing; (2) a pre-implementation cross-sectional survey designed and distributed to measure Nurse Manager, Off-tour Nurse Coordinator/Supervisor, and direct care nurse clinical experience with code blue events as well as self-efficacy in performance; (3) a retrospective chart review (observational) conducted following implementation of the new, standardized code blue flow sheet and leader-driven team debriefing checklist; and (4) a post-implementation cross-sectional survey designed and distributed to measure Nurse Manager, Off-tour Nurse Coordinator/Supervisor, and direct care nurse perspective of the educational training for the new, standardized code blue documentation and leader-driven debriefing as well as self-efficacy in performance. Descriptive statistics were determined appropriate when analyzing the pre- and post-implementation chart reviews because of the variance in cases. A one-way ANOVA with a test for homogeneity of variances (Levene test) was determined to be a feasible statistical analysis to evaluate the relationship between implementation of the evidence and self-efficacy because of the anonymity of the quantitative nursing surveys and difference in number of responses pre-implementation compared to post-implementation.

Validity

Internal validity for the project considered the accuracy of the evidence-based interventions used in standardizing code blue processes at VHSO. Observed positive changes in code blue documentation and leader-driven debriefing attributed to the interventions mentioned. Nevertheless, the student investigator factored in potential threats to the internal validity during the review and testing processes. Regarding external validity, the 122 code blue events at VHSO

between October 1, 2011 and December 31, 2017 represented a diverse population of Veterans. The quantitative nursing surveys and retrospective chart reviews yielded similar diversity. The generalizability of the project results would be applicable to other patient populations and health care settings.

Outcome Measurement

The primary outcomes measures for the project were the completion of the code blue flow sheet in CPRS and the leader-driven debriefing checklist. The primary outcomes were dependent on employee compliance in accurately completing the standardized flow sheet and checklist, which was determined through the post-implementation retrospective chart review. The secondary outcome measure for the project was self-efficacy in performance and crisis resource/nursing management. This was determined through the pre- and post-implementation quantitative nursing surveys.

Measurement Instruments

The standardized code blue flow sheet in CPRS and leader-driven debriefing checklist was updated based on templates being used by other VA hospitals within the same Veteran Integrated Service Network (VISN) as well as from a systematic review for clinical documentation and debriefing of in-hospital cardiac arrest events. Regarding validity, these updates were published standardized processes at other VA hospitals. There was an interrater level of reliability for standardized code blue documentation and a leader-driven debriefing checklist. Self-efficacy in performance and crisis resource/nursing management was measured through an adapted version of the Clinical Nurse Leaders Self-Efficacy Scale (CNLSES) quantitative survey. In terms of validity, this scale has been well published. There is a test-retest level of reliability in the adapted CNLSES survey, meaning variation is minimal with

repeatability (see Appendix P for the pre- and post-implementation survey designed and distributed to measure Nurse Manager, Off-tour Nurse Coordinator/Supervisor, and direct care nurse clinical experience with code blue events as well as self-efficacy in performance).

Quality of Data and Analysis Plan

Standardized code blue documentation and debriefing checklists, as well as the CNLSES, are frequently referred to in the literature. While there was evidence evaluating one or two components of the measurements in a study, no studies were identified utilizing all three measures together. It was not the student investigator's intent or goal to make correlations conclusively between the three measures in the short-term.

The primary outcome of the project was completion of code blue documentation and leader-driven debriefing with a benchmark of 95% and goal of 100% compliance. The secondary outcome of the project was self-efficacy in performance and crisis-resource nursing management. The retrospective chart review from October 1, 2011 through December 31, 2017 identified 122 code blue events, with 79 inaccuracies (missing rhythm strips, missing documentation and/or no post event debriefing) yielding a 65% error rate (35% compliance rate). Of the 122 identified events, 41 deaths were reported yielding a 34% mortality rate for the time-period. Twenty-seven inaccuracies were identified among the 41 deaths yielding a 66% error rate (34% compliance rate).

The second retrospective chart review was conducted six months post implementation; however, as previously mentioned, this review did not identify a comparable number of code blue events to the initial retrospective chart review. Thus, simple descriptive statistics were used to describe the data sets (mean, minimum value, maximum value, median, and mode). Demographic information was collected and measured via the survey from Nurse Managers, Off-

tour Nurse Coordinators/Supervisors, and direct care nurses working within units 2A/2B (medical surgical), ICU, Outpatient Surgery, PACU, GI/Endoscopy, OR and the Emergency Department.

Demographic information included age group, gender, highest level of nursing degree earned, years of employment in direct care nurse role at VHSO, years of employment in the direct care nurse role within civilian health care (if applicable), years of employment as a Nurse Manager at VHSO (if applicable), years of employment as a Nurse Manager or other nursing leadership role within civilian health care (if applicable), years of employment as an Off-tour Nurse Coordinator/Supervisor at VHSO (if applicable), number of code blue events responded to or participated in at VHSO, number of code blue event responded to or participated in within civilian health care (if applicable), and participation in code blue event debriefing at VHSO. Self-efficacy in performance and crisis resource nursing management was measured via the same survey. The eight questions were adapted from the CNLSES. The pre-implementation survey was distributed to 100 nurses with response back from 48. The post-implementation survey was distributed to 100 nurses with response back from 47 (see Appendix Q for the data collection templates of the pre- and post-implementation retrospective chart reviews, as well as nursing self-efficacy performance).

A priori power analysis was conducted based on the pre-implementation (n=48) and post-implementation (n=47) survey response from direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors. A homogeneity of variances test (Levene test) and one-way ANOVA were most appropriate based on the sample and project. The data collected through the project was compared to published data; however, few of the published studies and supporting evidence were within the Veteran health care setting (see Appendix R for the statistical analysis

template). Errors in data collection and transcribing were considered as potential threats to the quality of the data.

Results

Setting and Participants

The setting for the project took place at VHSO located in Fayetteville, Arkansas. The student investigator identified 122 code blue events at VHSO from October 1, 2011 to December 31, 2017 following the initial retrospective (observational) chart review. There were nine code blue events identified through the second retrospective (observational) chart review following the project pilot period of July 1, 2018 to December 31, 2018.

The pre- and post-implementation quantitative nursing surveys were delivered to 100 direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors working on the following units at VHSO: 2A/2B (medical surgical), ICU, Outpatient Surgery, PACU, GI/Endoscopy, OR and the Emergency Department. Direct care nurses working in the inpatient behavioral health unit (1A), Primary Care Clinic, Specialty Clinics, Outpatient Mental Health Clinic, inpatient palliative care unit, and the hospital's Community-Based Outpatient Clinics were excluded in the sample. Forty-eight participants (48%) responded to the pre-implementation survey while 47 (47%) responded to the post-implementation survey.

Intervention Course

The student investigator worked closely with VHSO's Nursing Quality Manager in developing the new standardized code blue flow sheet and leader-driven team debriefing checklist from February 2018 to May 2018. Education regarding the template changes and new leader-driven team debriefing checklist was provided to all direct care nurses, Nurse Manager, and Off-tour Nurse Coordinators/Supervisors in June 2018. This was following approval of

changes by the Office of Quality, Safety, and Value; the ICU Committee, and updates to CPRS by the Clinical Applications Coordinator.

The pre- and post-implementation quantitative nursing surveys consisted of identical questions and were developed in January 2018. The pre-implementation survey was distributed to the participants in February 2018, while the post implementation survey was distributed to the participants at the end of December 2018 following the pilot period. The survey consisted of 13 standard questions (age, gender, education, and clinical experience), and seven nursing self-efficacy questions (adapted CNLSES; see Appendix P for the pre- and post-implementation quantitative nursing survey analysis). The Talent Management System module regarding standardized code blue documentation and leader-driven team debriefing is still being developed by VHSO's education department based on information provided by the student investigator. It is expected to be implemented as part of the nursing annual competency (1.0 CEU).

Outcome Data

Code blue documentation and leader-driven debriefing. The primary outcome was accurate completion of the code blue documentation and leader-driven debriefing checklist with a benchmark of 95% and goal of 100% compliance. The pre-implementation retrospective chart reviews identified 122 code blue events, with 79 inaccuracies (missing rhythm strips, missing documentation and/or no post event debriefing) yielding a 65% error rate (35% compliance rate). Of the 122 identified events, 41 deaths were reported yielding a 34% mortality rate for the time-period. Twenty-seven inaccuracies were identified among the 41 deaths yielding a 66% error rate (34% compliance rate).

The post-implementation retrospective chart reviews identified nine code blue events, with one inaccuracy (no post event debriefing) yielding an 11% error rate (89% compliance

rate). Of the nine identified events, four deaths were reported yielding a 44% mortality rate for the six-month time period. The one inaccuracy was not identified among the four deaths.

Demographics, clinical experience, and self-efficacy. The secondary outcome took into consideration demographic information, nursing clinical experience, and self-efficacy in performance and crisis-resource nursing management. With statistical significance of $p<.05$, Levene's test of equality for variance was statistically significant for age group ($p=.001$), gender ($p=.012$), and highest level nursing degree ($p=.003$) among the participants pre- and post-implementation. Based on this, a one-way ANOVA was performed showing no statistical significance between the pre- and post-implementation participants for age group ($p=.935$), gender ($p=.958$), and highest level nursing degree ($p=.910$).

Questions four through 11 and 13 on the nursing quantitative surveys yielded similar results for significance. Levene's test of equality for variance was statistically significant for years of employment in direct care nurse role at VHSO ($p=.008$), years of employment in the direct care nurse role within civilian health care ($p=.002$), years of employment as a Nurse Manager or other nursing leadership role within civilian health care ($p=.003$), years of employment as an Off-tour Nurse Coordinator/Supervisor at VHSO ($p=.027$), and number of code blue event responded to or participated in within civilian health care ($p=.048$). The same test of equality for variance was not statistically significant for years of employment as a Nurse Manager at VHSO ($p=.109$), number of code blue events responded to or participated in at VHSO ($p=.279$), participation in code blue event debriefing at VHSO ($p=.699$), and familiarity in completing the code blue flow sheet ($p=17.071$).

One-way ANOVA showed no statistical significance between the pre- and post-implementation participants years of employment in direct care nurse role at VHSO ($p=.974$),

years of employment in the direct care nurse role within civilian health care (*p*=.955), years of employment as a Nurse Manager at VHSO (*p*=.859), years of employment as a Nurse Manager or other nursing leadership role within civilian health care (*p*=.930), years of employment as an Off-tour Nurse Coordinator/Supervisor at VHSO (*p*=.908), number of code blue events responded to or participated in at VHSO (*p*=.611), number of code blue event responded to or participated in within civilian health care (*p*=.980), and participation in code blue event debriefing at VHSO (*p*=.087). ANOVA was statistically significant between the pre- and post-implementation participants with familiarity in completing the code blue flow sheet (*p*=.033).

Levene's test of equality for variance was not statistically significant for the CNLSES self-efficacy questions 15 through 21 (CNLSES 1, 2, 3, 4, 5, 6 and 7): CNLSES 1 (*p*=8.550), CNLSES 2 (*p*=7.885), CNLSES 3 (*p*=31.288), CNLSES 4 (*p*=70.062), CNLSES 5 (*p*=28.240), CNLSES 6 (*p*=7.529), and CNLSES 7 (*p*=9.769). One-way ANOVA showed statistical significance between the pre- and post-implementation participants for the CNLSES self-efficacy questions 15 through 19 (CNLSES 1, 2, 3, 4 and 5): CNLSES 1 (*p*=.038), CNLSES 2 (*p*=.022), CNLSES 3 (*p*=.000), CNLSES 4 (*p*=.000), and CNLSES 5 (*p*=.000). The CNLSES 6 (*p*=.057), and CNLSES 7 (*p*=.058) were slightly increased above the statistical significance margin between the pre- and post-implementation participants. There was no missing data for the analysis.

Discussion

The primary and secondary outcomes of the EBPQI project were met. Prior to piloting the new standardized code blue flow sheet and leader-driven team debriefing checklist, there were a significant amount of documentation errors (missing EKG/code strips, incorrect documentation of airway/ventilation and circulation, inconsistent vital signs) and inconsistent

debriefing following code blue events. Upon implementing the new code blue flow sheet template and debriefing checklist and providing direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors education regarding the changes, there was a statistically significant increase in accurate documentation and debriefing compliance. This was based on the pre-implementation retrospective chart reviews of 122 code blue events (35% compliance rate for correct documentation) versus the post-implementation retrospective chart reviews of nine code blue events (89% compliance rate for correct documentation). While all questions on the quantitative nursing survey were relevant and meaningful to the project in identifying nurse self-efficacy levels, response in the CNLSES portion suggests improved self-efficacy in performance, and adherence to standardized processes. One-way ANOVA between the pre- and post-implementation participants for the CNLSES self-efficacy questions 15 through 19 (CNLSES 1, 2, 3, 4 and 5) was CNLSES 1 (p=.038), CNLSES 2 (p=.022), CNLSES 3 (p=.000), CNLSES 4 (p=.000), and CNLSES 5 (p=.000). The CNLSES 6 (p=.057), and CNLSES 7 (p=.058) were slightly increased above the statistical significance margin between the pre- and post-implementation participants. This was based on the pre-implementation survey response (n=48) versus the post-implementation survey response (n=47).

Successes

There were many successes regarding the development and implementation of the EBPQI project. Considering the nature of VHSO's code blue documentation errors and inconsistencies in leader-driven team debriefing prior to implementation, the results post-implementation exhibits how an integrated, interdisciplinary approach with the correct tools lends to improved outcomes. Awareness of variability in code blue documentation and debriefing led to consideration for the overall team dynamic during code blue events, resuscitation practices, and

nursing self-efficacy in performance. Emphasizing the strengths of standardized code blue processes for documentation and debriefing brought awareness to the facility's stakeholders on the value of sustainable change and the impact on overall Veteran outcomes.

Study Strengths

The EBPQI intervention of a more standardized code blue flow sheet for documentation and leader-driven team debriefing checklists was supported by VHSO's organizational structure and culture of implementing best practice for the Veterans. Acknowledging the premise of Bandura's self-efficacy theory and Kotter's model of change prior to the project development and implementation, guided the student investigator and stakeholders at VHSO in identifying the most meaningful learning activities, developing performance improvement activities, and assessing direct care nurses' and nurse leaders' self-efficacy in clinical performance and competency for code blue processes. This led to positive, effective use of Rosswurm and Larabee's Model for Evidence-Based Practice Change considering the framework factored in the potential variables of behavioral and organizational change at VHSO.

Results Compared to Evidence in the Literature

The synthesis of evidence demonstrated the benefits of implementing standardized code blue documentation and educational debriefings led by a nurse leader at VHSO. The new standardized code blue flow sheet and debriefing checklist defined the expectations of direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors while promoting a measurable patient care process, similar to the effect discussed by Leotsakos et al. (2014) and Hagwood (2017). Noting the positive correlation (r = .70) between standardization and reduction of risk, health care costs, workflow inefficiencies, and employee confidence levels (Leotsakos et al., 2014; Hagwood, 2017; O'Donoghue et al., 2015), standardization of care and process review

promoted new learning opportunities and defined best practices.

The direct relationship between standardized processes for code blue documentation, team debriefing sessions, and improved patient outcomes was noted early in the project development phase. Cardiac arrest survival had been correlated (r = .80) to poor resuscitation performance, distractions during code blue events, and lack of constructive feedback following these events (Sutton et al., 2012). Thus, the focus was placed on developing a streamlined process for clear documentation, structured team debriefing, and quantitative monitoring.

Limitations

Internal Validity Effects

The EBPQI project evaluated the effect of standardizing the code blue flow sheet and leader-driven team debriefing checklist, as well as the quantitative nurse feedback regarding clinical experience and self-efficacy in performance. Considering the retrospective review process and nature of the health care setting, comparisons between the pre- and post-implementation phases could lessen the validity of the results.

External Validity Effects

Considering the setting size, making conclusive statements regarding the relationships between standardizing the code blue flow sheet and debriefing checklist, and results of the quantitative nursing surveys may pose questions by other facilities in Northwest Arkansas. While there was a similar response rate for the pre- and post-implementation quantitative nursing surveys (48 pre- and 47 post-), it is unknown whether the same nurses responded to the pre- and post-implementation surveys due to the anonymity of the responses.

Sustainability of Effects and Plans to Maintain Effects

Sustainability of the effects are dependent on 1) continual review of compliance metrics;

2) reassessment of the relationship between increased team debriefing, code blue documentation, resuscitation practice, and nursing performance; and 3) the interdisciplinary approach for process improvement. The project was deemed a sustainable program at VHSO based on training, yearly competencies, and quality monitoring by the Office of Quality, Safety, and Value of the standardized code blue flow sheet and debriefing checklists.

Efforts to Minimize the Study Limitations

The standardized code blue flow sheet and leader-driven team debriefing checklist were developed utilizing evidence-based components of event documentation and debriefing. Demographic, nursing clinical experience, and self-efficacy measures between the pre- and post-implementation changes were obtained through the quantitative nursing surveys to identify similarities and differences between the groups and whether the standardized changes made an impact on nurse knowledge, expectations, and confidence levels. Obtaining and analyzing the data in this manner, diminished study limitations of the pre- and post-retrospective chart reviews and differing number of code blue events for these time periods.

Interpretation

Expected and Actual Outcomes

Decreased code blue documentation errors along with improved leader-driven team debriefing were the expected and actual primary outcomes of the EBPQI project. Factoring in the new streamlined, standardized code blue flow sheet and debriefing checklist for nurse leaders, nurse education and updates to VHSO's Standard Operating Protocol/Procedures and the Medical Center Memorandums regarding code blue events defined expectations and set the standard for accountability of direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors. Improved nursing self-efficacy in performance and nursing

management were the expected and actual secondary outcomes of the project. Nurse confidence in performance and expectations for the code processes improved significantly over the six-month pilot period, evident when comparing the pre-implementation to the post-implementation nurse survey responses (see Appendix P for the pre- and post-implementation quantitative nursing survey analysis).

Intervention Effectiveness

Implementation of the new standardized code blue flow sheet and leader-driven team debriefing checklist combined with guidance and education significantly decreased documentation errors and improved compliance in conducting the debriefing sessions. In addition, improved self-efficacy in nursing performance could be inferred. Similar changes to the code blue flow sheet and debriefing checklists could be implemented at other VA medical centers (VAMCs) if warranted by quality metrics. Changes to code blue documentation and debriefing checklists within the civilian health care setting could also be considered but would need to be adjusted based on the needs of the facility and electronic medical record platform. Like many civilian health care settings, the VHA is focused on ensuring best practices are in place at all VAMCs lending to improved Veteran outcomes and high-performing facilities. High-performing direct care nurses and nurse leaders with high self-efficacy will improve overall team performance and adherence to the evidence-based standardized guidelines for code blue processes.

Intervention Revision

Based on current quality monitoring and metrics at VHSO, there are no revisions warranted for the new code blue flow sheet or leader-driven team debriefing checklist. However, adapting and making changes to the documentation may be necessary moving forward to ensure

sustainability and continued delivery of exceptional care to Veterans.

Expected and Actual Impact to Health System and Costs

The expected and actual impact to VHSO was positive based on the improved nursing compliance with code blue documentation and debriefing, as well as improved self-efficacy in performance. Generally speaking, nurses make up the largest group of health care providers in most health care systems. Thus, direct care nurses, Nurse Managers, and Off-tour Nurse Coordinators/Supervisors play a vital role in accurate documentation in CPRS and performance improvement initiatives. While there were no significant health care expenditures directly related to the pre-implementation code blue documentation errors, accurate and complete nursing documentation of code blue events can be a direct indicator of the quality of care (Akhu-Zaheya, Hani, & Al-Maaitah, 2017).

Conclusions

The evidence elaborates on the feasibility of standardized code blue processes that were applied at VHSO, specifically documentation and leader-driven debriefing sessions. Although health care professionals receive consistent, standardized training in BLS and ACLS to respond in the event of cardiac arrest (AHA, 2017c), variability in code blue documentation and team debriefing continues to be a concern among health care facilities (Couper et al., 2016; Rivera-Chiauzzi et al., 2016; Sunde et al., 2007). Findings from the synthesis and integration of evidence emphasized standardized protocols reduce patient safety risk, health care costs, and workflow inefficiencies while increasing the confidence levels of health care professionals (Leotsakos et al., 2014; Hagwood, 2017; O'Donoghue et al., 2015; Sunde et al., 2007). Furthermore, the evidence supported best practice models for standardized code blue processes which included effective communication, documentation, and debriefing; high-performing

teams; strong nurse leaders; and behavior change (Department of Veterans Affairs, OIG, 2015b; O'Donoghue et al., 2015; Hunziker et al., 2011; McQueen et al., 2004; Sunde et al., 2007).

The level of knowledge or training in cardiopulmonary resuscitation, such as BLS and ACLS, does not guarantee an understanding by health care professionals about the importance of concise code blue documentation and leader-driven team debriefings following code blue events. The effectiveness of implementing standardized code blue documentation and educational debriefings led by a nurse leader were supported by the evidence. Individual debriefing sessions, followed by monthly group debriefing sessions/case studies improved patient outcomes at discharge, mortality rates, and the confidence level of health care professionals responding to future code blue events (Couper et al., 2016; Sutton et al., 2012). In addition, structured team debriefing led by a nurse leader or manager, clear event documentation, and monthly quantitative monitoring of code blue events decreased variability in resuscitation performance and distractions (Sutton et al., 2012). Implementing standardized code blue documentation led to more streamlined patient care and transitions among health care professionals (Sukul et al., 2017).

A positive relationship exists between strong self-efficacy in crisis resource and nursing management skills, and the ability of the Nurse Manager or Off-tour Nurse Coordinator/Supervisor to effectively lead the code blue team while limiting outer-loop communication (Taylor et al., 2017). High self-efficacy improved performance, adherence to standardized processes, and confidence level among all health care professionals during stressful situations (Bandura et al., 1989; Castelao et al., 2015; Gilmartin & Nokes, 2015; Kennedy et al, 2015; Plant et al., 2011; Taylor et al., 2017). Considering high self-efficacy in practice, the ability to adjust to organizational and behavioral change was found to be vital in ensuring

compliance with standardized processes of care (Straatmann et al., 2016; Appelbaum et al., 2012). Organizational and behavioral change was supported by Kotter's model of change theory (Appelbaum et al., 2012). The evidence further recommended consideration of the variability in cardiopulmonary resuscitation practice, monitoring, resource availability for health care professionals, and quality improvement practices when developing and implementing code blue processes (Edelson et al., 2014; Meaney et al., 2013).

The standardized process included standardized checklists, leader-driven debriefing, and event documentation to ensure practice compliance and quality review. Limitations and weaknesses within the evidence of the intervention could be inferred based on the number of supporting literature specific to Veteran health care systems. The majority of supporting evidence for standardized code blue processes, documentation, leader-driven debriefing sessions, and self-efficacy performance were focused within the civilian health care sector.

Although the standardized process was supported by the VHA's QUERI and Office of Quality, Safety, and Value divisions (McQueen et al., 2004), health care leaders and providers at VHSO posed conflicting ideas about what was the best standardized process based on institutional values (Schaffer, Sandau, & Diedrick, 2012). Both the theory of self-efficacy and Kotter's model of change were applicable to the project due to the challenges faced by health care systems when there is an unwillingness to adapt to or foster change. Considering this, Rosswurm and Larabee's Model of EBP Change seemed most appropriate as the conceptual framework guiding the project. This was a multidisciplinary approach and factored in variables of organizational and behavioral change.

Further Study and Dissemination

Standardization of care and processes is not a new concept, but often poses concerns for health care providers and institutions due to a probability of failure with components of standardization. Nevertheless, implementation of an evidence-based standardized review process for code blue events, with inclusion of event documentation and post-event educational team debriefings sets a standard for accountability and compliance with best practices. The project addressed current institutional concerns with missing code blue documentation and inconsistencies of leadership-driven team debriefings, which took into consideration critical clinical concepts and quality of health care.

The project is a sustainable program at VHSO after completion of the doctoral program. Sustainability is based on new employee training during orientation as well as yearly competencies completed in TMS, maintaining the standardized code blue flow sheet and leader-driven debriefing checklists, and quality monitoring by the Office of Quality, Safety, and Value. Key stakeholders recognize continued sustainability accounts for modifications to these components based on employee, Veteran, and hospital needs.

Project results have been disseminated to key stakeholders, AFGE representatives, and health care professionals at VHSO. In addition, results will be disseminated at the University of Missouri-Kansas City as required by the student investigator. It is anticipated the project and results will be published. The project was presented at a nursing conference in the proposal and pilot stage. Long-term outcomes for the project are to develop a stronger program for standardized code blue documentation and leader-driven team debriefing in other Veteran Health Care System facilities and develop a crisis resource management training program for nursing staff and management. The long-term outcomes will begin at the VISN level and expand system-

wide as the evidence supports increased leader-driven team debriefing improves overall code blue documentation and nurse self-efficacy performance during code blue events.

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Appendix A
Definition of Terms

Behavioral Change: A complex process of transform or modifying human behavior (Bartholomew, Parcel, Kok, & Gottlief, 2001).

Cardiac Arrest: Cardiac arrest refers to an electrical malfunction within the heart, causing an arrhythmia (AHA, 2016). Blood flow is impeded to the brain, lungs, and eventually other bodily organs when the pumping action of the heart is disrupted due to the electrical malfunction (AHA, 2016). This leads to unconsciousness and no pulse, termed cardiac arrest.

Code Blue: Term used to identify cardiopulmonary arrest emergencies (Department of Veterans Affairs, OIG, 2015b).

Code Blue Debriefing: A discussion between a group of two or more health care providers following a code blue event with the intent to review, analyze, and reflect upon what happened during the event (Fey & Jenkins, 2015).

Code Blue Documentation: The written and electronic description regarding the details of a code blue event (Sukul et al., 2017).

Self-Efficacy: An individual's ability to effectively perform a task within the work environment or specific situation (Gilmartin & Nokes, 2015).

Standardization of Care: A comprehensive process agreed upon and implemented by key stakeholders to improve overall organization and patient outcomes (Leotsakos et al., 2014). Standardization of care accounts for the specifications, criteria, methods, processes, designs, and practices used when implementing best practices focused on safety, quality, and reduction of variation (Leotsakos et al., 2014, p. 110).

Appendix B
Hierarchy of Evidence

Rating System for the Hierarchy of Evidence For an Interventional Inquiry (Modification by Dr. Lindholm for course N5613)	
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs. *Evidence-based clinical practice guidelines based on systematic reviews of RCTs).* *
Level II	Evidence obtained from well-designed RCT. *Quantitative systematic review of well-designed controlled trial without randomization.*
Level III	Evidence obtained from well-designed controlled trial without randomization *(quasi-experimental).* *Quantitative systematic review of case-control, cohort, or correlational studies.*
Level IV	Evidence from well-designed case-control or cohort study *(or cross-sectional study)*
Level V	Evidence from systematic review of *quantitative* descriptive *(no relationships to examine)* or qualitative studies.
Level VI	Evidence from a single *quantitative* descriptive *(no relationships to examine in the study) or* qualitative study
Level VII	Evidence from the opinion of authorities and/or reports of expert committees

Melnyk, B.M.& Fineout-Overholt., E. (2015). *Evidence-based practice in nursing and healthcare.* Philadelphia Lippincott Williams & Wilkins.
**Italics, appropriate in this category, modification by LL 2017 based on opinions from experts to place SR at one level higher than single study design level.*

Appendix C

PICOTS: For Nurse Managers and Off-tour Nurse Coordinators/Supervisors, will implementation of a standardized process for code blue events versus the current practice of no standardized process improve code blue documentation and leader-driven post event debriefing in 6 months at the Veteran's Health Care System of the Ozarks?

First Author, Year, Title, Journal	**Purpose, Theory Used (if reported)**	**Research Design[1], Evidence Level[1]**	**Sample, Setting**	**Study Variables**	**Measures & Reliability (if reported)**	**Results & Analysis Used**	**Limitations & Usefulness**
Standardization of Care and Process Review							
Hagwood. (2017). Standardization of the healthcare environment. *Press Ganey: Industry Edge*.	Environmental and process standardization helps promote a culture of safety and high reliability in health care. Atheoretical.	Evidence-Based Practice Guideline from Authorities Level VII	n/a	n/a	Processes and pathways standardized to avoid waste and variability; 5S (Sort, Set in order, Shine, Standardize and Sustain).	Implementing standardized processes while integrating a culture of safety into the overall mindset of health care professionals significantly reduces medical errors; positive correlation (r = .70) between standardization and reduction of risk, health care costs, and workflow inefficiencies	(-) No sample (-) No study variables (-) Lower level of evidence (+) Evidence-based report from expert authority

						Failure modes and effects analysis (FMEA), 3P (production, preparation, and process), simulation, and standardized environment.	
Department of Veterans Affairs, Office of Inspector General. (2015b). Health care inspection: Delay in emergency airway management and concerns about support for nurses. *Report No. 15-00533-440*.	The Office of Inspector General's (OIG) Office of Healthcare Inspections' assessment of circumstances for a patient's death at a VA, and actions taken during Code Blue event. Atheoretical.	Systematic Review with Meta-Analysis (qualitative) Level V	One patient death related to current Code Blue process; survey responses from 416 out of 655 nurses; survey response from 23 out of 45 Medical Surgical nurses. 180-bed VA hospital setting.	*Independent Variable*-process and protocols for Code Blue events; *Dependent Variables*-CPR, airway management, advanced care planning, code status, patient identification wristband, VA All Employee Survey	Quality Standards for Inspection and Evaluation	Lack of follow through for Advanced Directives discussion; incorrect code status printed on wristband; incorrect code status led to delay in life-sustaining intervention; staff behavior; nursing leadership. Retrospective investigation and review	(-) Lower level of evidence (+) Supporting evidence from systematic review conducted by OIG at a VA facility regarding Code Blue processes
O'Donoghue et al. (2015). Nurses' perceptions of	Explore nurses' perception of roles, team performance,	Systematic Review with Meta-	Convenience sample of clinical nurses (n=239) participating in	*Independent Variable*-Standardized process/care	Review of descriptive studies in support of	Positive correlation (*r* = .63) between standardized	(-) Large sample. (-) Vague questions.

role, team performance, and education regarding resuscitation in the adult medical-surgical patient. *MedSurg Nursing*.	and educational needs during resuscitation using an electronic survey. Atheoretical.	Analysis (qualitative) Level V	Code Blue events on Medical Surgical unit. Acute Care Level 1 Trauma Center	during cardiac arrest; *Dependent Variables*-teamwork, leadership training, nurse knowledge and skill level	survey; qualitative survey	code blue processes and high-performing teams, strong team leaders/nurse managers, consistent training, and nurse knowledge/ skill level; direction for clinical practice, nursing education, and future research to improve resuscitation care. SPSS Version 19.0; descriptive statistics	(+) Expert reviewed questions. (+) Clinical practice, nursing education, and future research. (+) Identified variability in nurse roles and performance expectations.
Leotsakos et al. (2014). Standardization in patient safety: The WHO 5S project. *International Journal for*	Standardization in patient safety: Facilitate the development, implementation and evaluation of SOPs to achieve	Controlled Cohort Study (quantitative) Level IV	Global participation from seven countries including the United States.	*Independent Variable*-Standardized process/care; *Dependent Variables*-SOPs, patient safety, medication	Experience evaluation, performance measures, event analysis, and culture surveys (baseline and	Positive correlation (r = .70) between standardization and reduction of risk, health care costs, and	(-) Large scale project (global) (+) Identified variation in clinical care and processes, leading to increased risk,

Quality in Health Care.	measurable, significant, and sustainable reductions in challenging patient safety problems. Atheoretical.			safety, surgical safety	follow-up); Triangulated High 5s evaluation strategy	workflow inefficiencies Information Management System (IMS) developed to facilitate storage, analysis, dissemination, and exchange of data (TWiki 4.2.4, Plugin API 1.2)	workplace inefficiencies, and increased costs.
Hunziker et al. (2010). Human factors in resuscitation: Lessons learned from simulator studies. *Journal of Emergency, Trauma, and Shock*.	To provide evidence from simulator cases assessing human factors and their influence on the performance of resuscitation teams and standardization of care. Atheoretical.	Systematic Review without Meta-Analysis (qualitative) Level V	n/a	*Independent Variable*-team performance during Code Blue; *Dependent Variables*-simulator scenarios, human errors, team behavior, leadership, standardized guidelines	Evaluation of simulator scenarios compared to standardized guidelines	Positive correlation (r = .63) between standardized code blue processes and high-performing teams, strong team leaders/nurse managers, consistent training, and nurse knowledge/ skill level	(-) Transfer of knowledge from simulator to clinical setting. (+) High-fidelity simulation demonstrates high degree of realism and used as standardized approach.

						Continuous quality improvement	
Sunde et al. (2007). Implementation of a standardized treatment protocol for post resuscitation care after out-of-hospital cardiac arrest. *Resuscitation*.	Implementation of a standardized post resuscitation protocol. Atheoretical.	Controlled Cohort Study (quantitative) Level IV	Patients admitted to ICU following an out-of-hospital cardiac arrest compared to controls.	*Independent Variable*- standardized care plan; *Dependent Variable*- survival outcome (unfavorable vs. favorable)	Survival outcome (survival to discharge); survival outcome 1-year post arrest	Pre-implementation survival rate 26% compared to 56% post-implementation (p=0.001). SPSS; Students t-test; Mann-Whitney test; Pearson x^2 with Yates continuity correction; Fisher's exact testing	(-) Not randomized (-) Subtle effects could influence outcome (+) 95% CI (+) Outcome based
McQueen et al. (2004). Overview of the Veterans Health Administration (VHA) quality enhancement research initiative (QUERI). *Journal of the American Medical Informatics Association*.	Integration of health services research, policy, and clinical care delivery designed to improve the quality, outcomes, and efficiency of VHA health care through the identification and implementation	Evidence-Based Practice Guideline from Authorities Level VII	n/a	n/a	The VHA QUERI was designed to identify and implement EBP in routine VHA health care settings.	Standardized code blue process applies quality improvement methods, leading to behavioral change needed for successful implementation within the VA health care setting	(-) No sample (-) No study variables (+) Valuable models for other public and private health care systems interested in standardizing continuous quality measurement and improvement

	of evidence-based practices in routine care settings. Atheoretical.					Standard six-step QUERI process, comprising a sequence of activities specified by the original designers of QUERI.	policies and practices. (+) Feasibility and value of significant investments
Code Blue Debriefing, Documentation, and Self-Efficacy Performance							
Couper *et al.* (2017). An evaluation of three methods of in-hospital cardiac arrest educational debriefing: The CPR debriefing study. *Resuscitation*	CPR Quality Improvement Initiative examines the effect of real-time audio-visual feedback and weekly group educational debriefing on CPR quality and patient outcomes. Atheoretical.	Controlled Cohort Study (quantitative) Level IV	Simple, random sample; 1,222 code blue events screened; Reduced to 1,198: 782 pre-intervention, 416 post-intervention. Three hospitals within same hospital system.	*Independent Variable*-educational debriefing approach (three options); *Dependent Variables*-effect on CPR quality (CPR quality metrics), effect on patient outcomes, participant feedback	CPR quality metrics; ROSC; hospital survival and neurological outcome at hospital discharge; debriefing intervention developed through synthesis of systematic review.	Chest compression depth between pre- and post-intervention periods across all hospitals (p=0.004), SPSS Version 22.0; $\chi 2$ of fisher-exact testing; t-test. Mann-Whitney U test	(-) Effect size small (-) Before/after study (+) Statistically significant results (+) 95% CI for options one and two (debriefings) (+) Team debriefing and confidence level in responding to future code blue events (r=.72).
Sukul *et al.* (2017). Clinical documentation of in-hospital cardiac arrest in a	Supporting evidence on importance of clinical documentation	Systematic Review without Meta-	101 in-hospital cardiac arrest cases with and without clinical documentation	*Independent Variable*-cardiac arrest clinical documentation; *Dependent*	Presence of free-standing in-hospital cardiac arrest clinical	51 events documented; 50 events not documented; presenting	(-) No meta-analysis performed. (-) Event details scattered;

large national health system. *Resuscitation*.	for patient care (cardiac arrest events) and quality improvement. Atheoretical	Analysis (quantitative) Level I		*Variables*-patient care transitions, effect on patient outcomes, scanned documents	documentation within the electronic medical record; documentation of presenting rhythm, time elapsed to start CPR, and time elapsed from CPR initiation to return to ROSC or death.	arrest rhythm documented (total 86 = 48 yes/38 no, *p*=0.01); documented time elapsed from code activation to start of CPR (total 33 = 25 yes/8 no, *p*=0.001); documented time elapsed from CPR initiation to sustained ROSC/death (total 67 = 37 yes/30 no, *p*=0.21) Fisher exact testing	lacking clinical context is some cases. (+) Recommends standardized documentation for code blue events. (+) Recommends facilitation of ongoing quality improvement initiatives focused on code blue care processes.
Sutton et al. (2012). Putting it all together to improve resuscitation quality. *Emergency Medicine Clinics of North America*.	Continuous quality improvement paradigm highlighting the improvement training methods before actual cardiac arrest events occur,	Controlled trials without randomizing (quantitative) Level III	In-hospital versus out-of-hospital cardiac arrest	*Independent Variable*-Code Blue process; *Dependent Variables*-improving training before cardiac arrest, monitoring and titrating quality	Continuous quality improvement bundle	CPR rates increased from 20% to 29% (*p*=.086); hypothermia therapy for admitted out-of-hospital cardiac arrest victims	(-) No randomizing (+) 95% CI (+) Quantitative debriefing

	monitoring quality during resuscitation attempts, and using quantitative debriefing programs after events to educate frontline care providers. Atheoretical.			during Code Blue event, debriefing following event		increased from 0% to 45%; survival to hospital discharge for all patients after out-of-hospital cardiac arrest improved from 8.5% to 19% (*p*=.011)	
Self-Efficacy and Nursing Management							
Taylor et al. (2017). A description of the "event manager" role in resuscitations: A qualitative study of interviews and focus groups of resuscitation participants. *Journal of Critical Care*.	Communication during resuscitation is essential for the provision of coordinated, effective care. Resuscitation communication previously originated from participants other than the team leader. Theoretical framework: Organizational and behavior change leadership	Systematic Review with Meta-Analysis (qualitative) Level V	Single-center; two separate focus groups; 24 ICU health care professionals (11 nurses, six respiratory therapists, seven physicians)	*Independent Variable*- resuscitation performance *Dependent Variables*- existence of outer-loop communication, functions fulfilled by outer-loop communication, leadership and the learning of event manager skills.	Attendance at resuscitation events; focus groups; interviews	44% of communication during a code blue event is driven by health care professionals; Audio-recorded, transcribed, analyzed, and coded focus groups and interviews; discussion and review by researchers; application of conceptual frameworks for	(-) Small sample (-) Low representation of junior nurses (-) Separation of professional groups due to logistics (+) Diverse sample (+) Formalizing an event manager during Code Blue event. (+) Outer-loop communication confirmed existence and threats.

						team functioning	
Straatman et al. (2016). Assessing employees' reactions to organization change: An integrative framework of change-specific and psychological factors. *The Journal of Applied Behavioral Science*.	Diagnostic assessments during the design, implementation, and evaluation of change management processes are increasingly emphasized in the change management literature and practice. However, evidence-based change management is challenged by the fragmented state of research on employees' reactions to change. Theoretical framework: Organizational and behavior change leadership	Controlled Cohort Study (quantitative) Level IV	255 of 874 employees participated	*Independent Variable*- employees' reaction to change *Dependent Variables*- change-specific management factors, psychological factors	Measurement of psychological factors; measurement of change-specific management factors; measurement model comparisons	70-80% failure rate for organizational and behavioral change among organizations SPSS; Cronbach's alpha; parametric bootstrapping used with 1,000 samples	(-) Present study failed to demonstrate significant relationship between change-related perceived behavioral control. (+) 47% of the variance to engage in change was explained (+) 90% CI

Castelao et al. (2015). Effect of CRM team leader training on performance and leadership behavior in simulated cardiac arrest scenarios: A prospective, randomized, controlled study. *BioMed Central Medical Education*.	Assessed the impact of the Crisis Resource Management (CRM) team leader training on CPR performance and team leader verbalization. Theoretical framework: Self-efficacy and nursing management	Randomized Controlled Study/Trial (based on self-efficacy theory and nursing management) Level II	56 four-person teams (medical students) reduced to 45 four-person teams, University setting	*Independent Variable*-crisis resource management *Dependent Variables*-BLS/ACLS airway management, rhythm recognition, defibrillation, team action simulation CPR scenario	Basic and advanced life support (BLS and ACLS) 90-min lecture; four instructor-led interactive tutorials; checklist based tool to evaluate key components of CPR according to standardized guidelines.	One crisis resource management team leader and three ACLS trained team members yields higher, positive correlation (r = .87) to response and competency in code blue scenarios compared to a non-crisis resource management trained team leader (r = .63) Statistical significance ($p < 0.05$) of NFT and ADH scores of CRM-TL compared to ACLS add-on groups was tested by t-tests; coding software Interact 9;	(-) Did not apply pre-training measurements of the students' CPR skills. (-) Unable to demonstrate the retention potential. (+) Randomly assigned sample. (+) 95% CI

						checklist was Delphi-validated; SPSS 20.0	
Gilmartin et al. (2015). A self-efficacy scale for Clinical Nurse Leaders: Results of a pilot study. *Nursing Economics*.	The Clinical Nurse Leaders Self-Efficacy Scale (CNLSES) could be used to identify specific learning activities as part of comprehensive orientation programs, and to develop relevant curriculum or performance improvement activities to gain the full benefits of practice. Theoretical framework: Self-efficacy	Cross-sectional Level IV	1,378 nurses certified as CNL	*Independent Variable*-self-efficacy *Dependent Variables*-cross-setting expectations for CNL, coordinating across disciplines, managing clinical outcomes, clinical quality improvement, risk management, self confidence	56-item 5-point Likert scale established survey based on Bandura's self-efficacy	Positive correlation (r = .70) between high self-efficacy and effective nursing leadership during stressful clinical situations. Quality survey software; Principal Components Analysis (PCA); Cronbach's alpha; Reliability of indices were further examined, assessing the internal consistency of responses.	(-) Final sample small, yet sufficient. (-) Unable to use confirmatory factor analysis/ structural equation modeling to assess reliability (+) Sample reflects demographic characteristics of nursing population (+) Empirical assessment
Kennedy et al. (2015). Development and	Develop/assess (psychometric) an instrument to	Systematic Review with Meta-	252 out of 301 senior nursing	*Independent Variable*-self-efficacy	Content and face validity assessment;	p<0.0001; no correlation (r=0.06)	(-) Moderate correlation between self-

psychometric assessment of the nursing competence self-efficacy scale. *Journal of Nursing Education*.	measure baccalaureate nursing students' self-efficacy for practice (NCES). Theoretical framework: Self-efficacy	Analysis (quantitative) Level I	students, University setting	*Dependent Variables*-proficiency, altruism, prevention, leadership	104 competency statements organized in five domains of professional nursing; 32 item self-efficacy assessment.	Shapiro-Wilk statistic; skewness and kurtosis; histogram; quantile-quantile plot; Cronbach's alpha; t-test	reported efficacy and actual competence (+) 8,064 data items collected with 85 outliers (0.01%) (+) Normally distributed
Appelbaum et al. (2012). Back to the future: Revisiting Kotter's 1996 change model. *The Journal of Management Development*.	Gather current arguments and counter-arguments in support of the classic change management model proposed by John P. Kotter in his 1996 book Leading Change. Theoretical framework: Kotter	Systematic Review without Meta-Analysis (qualitative) Level V	n/a	*Independent Variable*-change management *Dependent Variables*-eight components of model	Evaluation of Kotter's model of change	70-80% failure rate for organizational and behavioral change among organizations Continuous performance improvement	(-) Not all studies validate the complete eight components of Kotter's model of change (+) Employee commitment to change (+) New approaches, behaviors, and attitudes help improve performance (+) Empirical
Plant et al. (2011). Validation of a self-efficacy instrument and its relationship to performance of crisis resource	Develop and validate an instrument to measure self-efficacy in crisis resource management (CRM) skills,	Systematic review of correlational study (quantitative) Level III	125 Pediatric residents	*Independent Variable*-self-efficacy *Dependent Variables*-known group comparison,	Self-efficacy instrument (measure self-efficacy in CRM skills); 30 question 5-point Likert scale; observer	Positive relationship (r = .89) between self-efficacy and performance during a code blue event, and	(-) Scenarios not identical for all residents (-) Not able to identify patterns of findings (+) Self-efficacy

management skills. *Advances in Health Sciences Education*.	and to examine the correlation between measured self-efficacy and performance during simulated resuscitations. Theoretical framework: Self-efficacy			comparison to performance	rating (ANTS system and Ottawa GRS – 15 items)	theoretical importance of self-efficacy in ongoing cardiac arrest training. Exploratory factor analysis (EFA); KMO statistic; confirmatory factor analysis (CFA); Chi square test; root mean square error of approximation; Tucker Lewis Nonnormed Fit Index; Comparative Fit Index; Cronbach's alpha	correlates with performance of resuscitation skills (+) Situation awareness (+) Environment management
Bandura et al. (1989). Effect of perceived controllability and performance standards on self-regulation of complex decision-making. *Journal of*	Tested the hypothesis that perceived controllability and stringency of performance standards would affect self-regulatory mechanisms	Randomized Controlled Study/Trial (continuation of original theory) Level II	40 males, 20 females in graduate program	*Independent Variable*-self-efficacy *Dependent Variables*-organizational controllability, performance standards, mediating self-	Simulated organization	ANOVA; performance standards $p<0.05$; trial blocks $p<0.01$; interaction between $p<0.05$	(-) Varying dynamics and personalities of subjects hindered how to best to utilize talents (+) Random sample

Personality and Social Psychology.	governing performance attainments of a simulated organization. Theoretical framework: Self-efficacy			regulatory determinants, organizational performance			(+) Subjects gained experience managing organization (+) Self-efficacy influences performance.
Cardiac Arrest Resuscitation Practice							
Edelson et al. (2014). Hospital cardiac arrest resuscitation practice in the United States: A nationally representative survey. *Journal of Hospital Medicine*.	Describe current US hospital practices regarding resuscitation care. Atheoretical.	Meta-analysis of RTC Level I	Random sample of 1000 hospitals from the American Hospital Association database, stratified into nine categories; hospital's CPR Committee Chair or Chief Medical/Quality Officer	*Independent Variable*-cardiac arrest resuscitation practice *Dependent Variables*-hospital teaching status, in-hospital resuscitation structure and practices, resource availability and quality improvement practices	27-item questionnaire	Variability among U.S. hospitals in debriefing, simulation training, documentation, and resuscitation care practices Responses from 439 hospitals with similar admission volume and teaching status (p=0.05); Stata 11.0; interquartile range; tests of significance p<0.05	(-) Therapeutic hypothermia rarely utilized (-) CPR assist technology rarely utilized (-/+) Variability in quality initiatives (+) Standardized RRTs (+) Standardized defibrillator

Meaney et al. (2013). Cardiopulmonary resuscitation quality: Improving cardiac resuscitation outcomes both inside and outside the hospital. *Circulation*.	Clear definitions of metrics and methods to consistently deliver and improve the quality of CPR will narrow the gap between resuscitation science and the victims and lay the foundation for further improvements in the future. Atheoretical.	Evidence-based clinical practice guidelines based on systematic reviews Level I	Health care professionals in North America and internationally; telephone conferences; Webinars; CPR Quality Summit	*Independent Variable*-CPR quality *Dependent Variables*-CPR performance by provider team, monitoring of physiological response to resuscitation, continuous quality improvement	Evaluation of standardized guidelines for CPR and performance improvement	Variability among U.S. hospitals in debriefing, simulation training, documentation, and resuscitation care practices Continuous quality improvement	(-) Significant need-improve monitoring and quality of CPR (-) Knowledge gaps exist (+) High-quality CPR recognized as the foundation for resuscitative efforts. (+) Target performance metrics

Appendix D

Sources of Self-Efficacy to Consider when Evaluating Performance during Code Blue Event

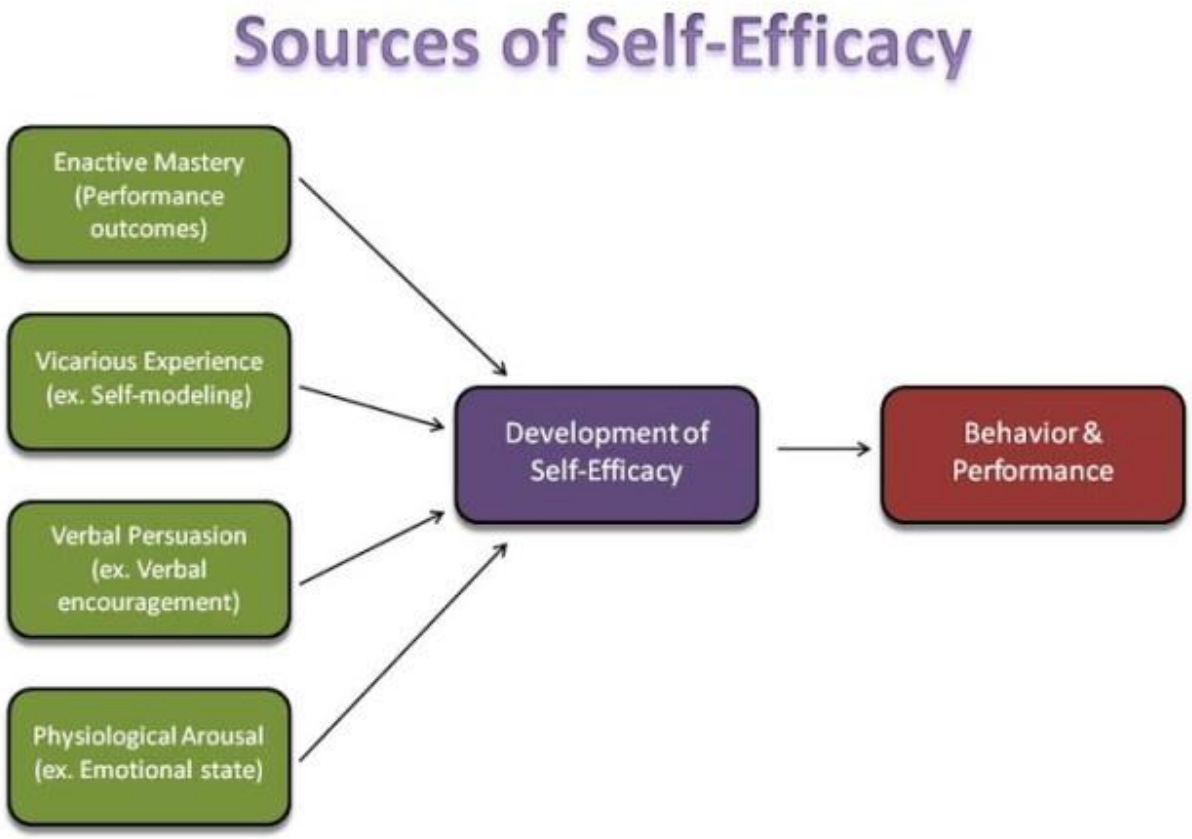


Diagram 1. Triadic Reciprocal Determinism. Retrieved from Miller (2010).

Appendix E
Social Cognitive Triadic Reciprocal Determinism

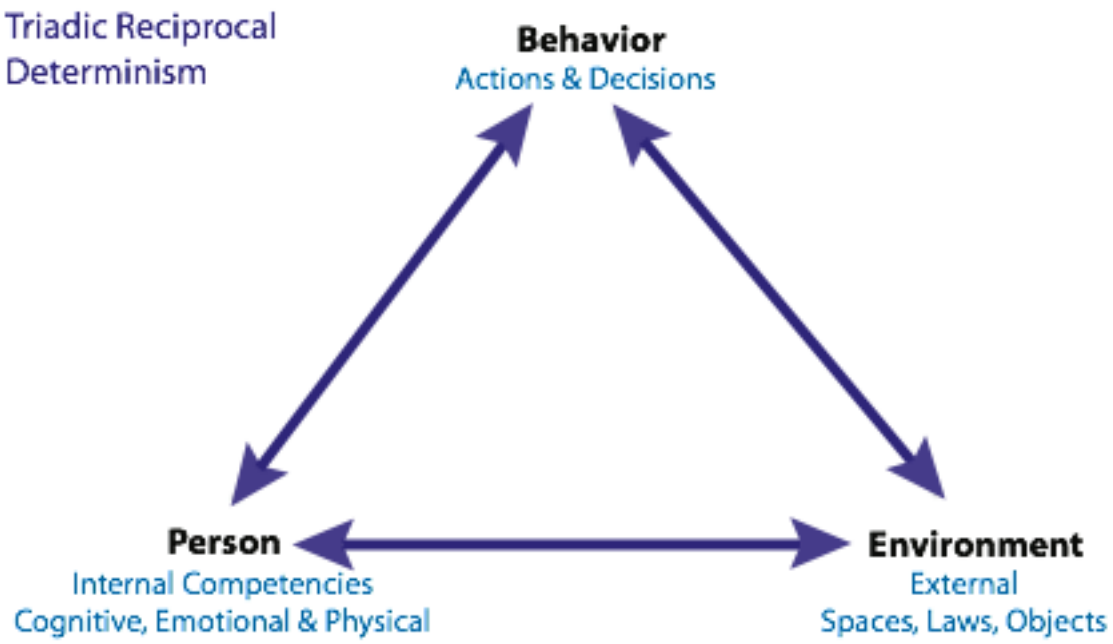


Diagram 2. Sources of Self-Efficacy. Retrieved from iEduNote (2017).

Appendix F
Kotter's Model of Change

Diagram 3. John Kotter's eight phases of change model. Retrieved from Miller (2016).

Appendix G
Initial Letter from R&D Committee at VHSO Authorizing Submission to CAVHS

DEPARTMENT OF VETERANS AFFAIRS
Medical Center
1100 North College Avenue
Fayetteville, AR 72703-6995

DATE: November 21, 2017
Title: *Implementation of a Standardized Process Review for Code Blue Events at VHSO with Inclusion of code Blue Documentation and Post-event Debriefing*

PRINCIPAL INVESTIGATOR: Jenanette Hill, RN

Your proposal as listed above has been reviewed and was discussed in the R&D meeting on November 15, 2017. This confirms that Ms. Hill has been approved to move on to the next step and submit her proposal to IRB to make a determination of research vs. non-research.

Please note that the VHSO R&D committee has final say regarding this determination. The project cannot be undertaken without a letter from this committee confirming a determination of research or non-research and authorizing initiation of the protocol.

Gretchen Gibson

Gretchen Gibson, DDS, MPH
Research Coordinator
Ext. 65265

Appendix H
Letter from CAVHS, Determination of Non-Research

DEPARTMENT OF VETERANS AFFAIRS
INSTITUTIONAL REVIEW BOARD
Central Arkansas Veterans Healthcare System
4300 West 7th Street
Little Rock, AR 72205

DATE:	February 8, 2018
TO:	Jeanette Hill, MSN, BSN, RN; BS Principal Investigator
FROM:	Ellen Fischer, PhD CAVHS Institutional Review Board Chair
PROTOCOL TITLE:	[1184083-1] Implementation of a standardized process review for code blue events at the Veteran's Health Care System of the Ozarks (VHSO).
SUBMISSION TYPE:	New Project
REVIEW TYPE:	Expedited Review
ACTION:	DETERMINATION OF NOT RESEARCH
EFFECTIVE DATE:	February 8, 2018

Thank you for submitting the ***New Project*** materials for the above activity. The CAVHS Institutional Review Board's designated reviewer has determined this activity does not meet the Common Rule or FDA definition of research. As such, neither IRB approval nor oversight of this project is required.

This determination will be reported to the IRB committee during the next convened IRB meeting. Neither you nor any of the identified collaborators participated in the review or decision making. No further action on submission 1184083-1 is required at this time.

The following items are acknowledged in this submission:

- Application Form - EBP application with signed non-research determination (UPDATED: 01/18/2018)
- Other - VHSO Request to review SIGNED.pdf (UPDATED: 01/18/2018)
- Other - VHSO Clinical Service Impact Statement SIGNED.pdf (UPDATED: 01/18/2018)
- VA - R&D Request to Review Research Proposal - VA - R&D Request to Review Research Proposal (UPDATED: 02/2/2018)

By copy of this letter, R&D will be notified of this Non-Research determination.

Ellen Fischer, PhD

FWA00002261
IRB00006264

This electronically generated document serves as official notice to sponsors and others of approval, disapproval or other IRB decisions. Only those individuals who have been granted authority by the institution to create letters on behalf of the IRB are able to do so. A copy of this document has been retained within CAVHS IRBNet records. The IRBNet System is fully compliant with

Appendix I

Letters from R&D Committee and IRB Subcommittee, Determination Non-Research

DEPARTMENT OF VETERANS AFFAIRS
Medical Center
1100 North College Avenue
Fayetteville, AR 72703-6995

DATE: February 22, 2018
Title: *1184083-1 Implementation of a standardized process review for code blue events at the Veterans Health Care System of the Ozarks (VHSO)*

PRINCIPAL INVESTIGATOR: Jeannette Hill, MSN, BSN, RN

Your proposal as listed above has been reviewed and was discussed in the R&D meeting on February 21, 2018. This project has been reviewed by both the VHSO IRB subcommittee and VHSO R&D Committee and deemed non-research.

We wish you well as you work through this evidence-based practice project. We look forward to seeing the results. All follow-up of this project going forward will be done by the VHSO Evidence-based Practice program.

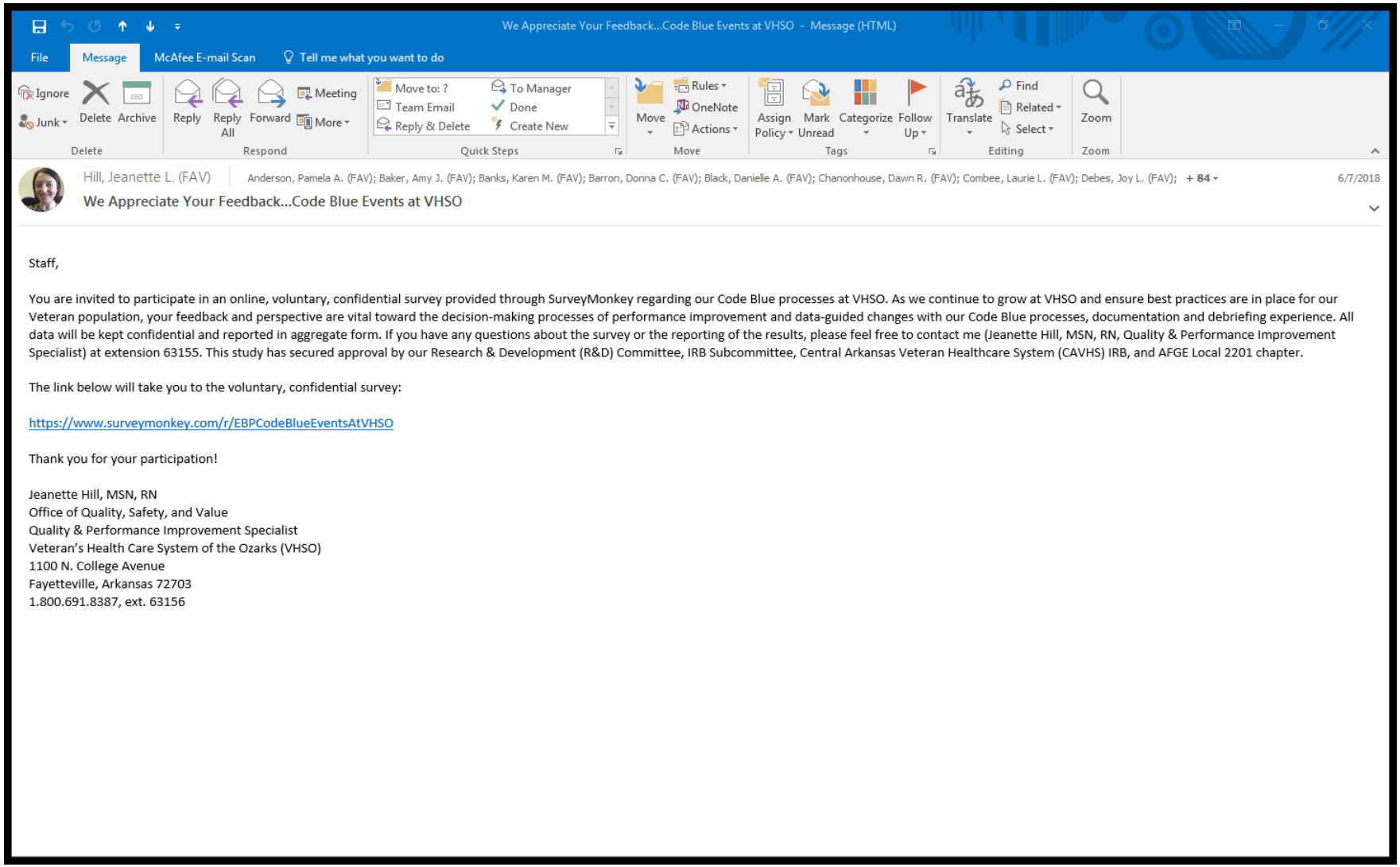
Gretchen Gibson

Gretchen Gibson, DDS, MPH
Research Coordinator
Ext. 65265

Appendix J
Budget, Funding and Cost Table

Jeanette Hill, DNP(c), MSN, RN				
DNP project start date: 06/2018; Funding will be allocated through VHSO, Office of Quality, Safety, and Value, and Nursing Clinical Support.				
Item	**Cost/Unit**	**Quantity**	**Amount ($)**	**Notes**
DNP student time (hours researching, initial stakeholder meetings/ collaboration)	$44.00	263.5 hours	$11,594.00	Amount student investigator would be compensated per hour/total by VHSO for gathering evidence in support of the DNP project and collaboration with stakeholders.
Stakeholder time commitment (mentor)	$55.00	24.5 hours	$1,347.50	Amount mentor (stakeholder) would be compensated per hour/total by VHSO for work with student.
Stakeholder time commitment (Nursing Quality Manager)	$44.00	24.5 hours	$1,078.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (ICU Manager; ICU Committee Member)	$53.00	24.5 hours	$1,298.50	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Nursing Clinical Support Nurse Educator; ICU Committee Member)	$44.00	24.5 hours	$1,078.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Pharmacist; ICU Committee Member)	$73.00	24.5 hours	$1,788.50	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Anesthesiologist; ICU Committee Member)	$164.00	24.5 hours	$4,018.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Emergency Department Manager; ICU Committee Member)	$37.00	24.5 hours	$906.50	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Pulmonologist; ICU Committee Member)	$109.00	24.5 hours	$2,670.50	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Chief of Medicine; ICU Committee Member)	$164.00	24.5 hours	$4,018.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Palliative Care Manager; ICU Committee Member)	$38.00	24.5 hours	$931.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Risk Manager)	$51.00	15 hours	$765.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Chief of Office of Quality, Safety, and Value)	$45.00	15 hours	$675.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Stakeholder time commitment (Clinical Applications Coordinator [CPRS] code blue template changes)	$32.00	15 hours	$480.00	Amount stakeholder would be compensated per hour/total by VHSO for work with the student.
Fee for upgraded Survey Monkey	$34.95	8 months	$279.60	Cost for upgraded Survey Monkey.
DNP student time	$44.00	10 hours	$440.00	Analysis and presenting time.
Paper checklists	$0.10	75	$7.50	Leader-driven (Nurse Manager/Off-Tour Nurse Coordinator/Supervisor) code blue debriefing checklists.
Total			**$33,375.60**	

Appendix K
Email Correspondence: Recruitment of Nurses



Hill, Jeanette L. (FAV) | Anderson, Pamela A. (FAV); Baker, Amy J. (FAV); Banks, Karen M. (FAV); Barron, Donna C. (FAV); Black, Danielle A. (FAV); Chanonhouse, Dawn R. (FAV); Combee, Laurie L. (FAV); Debes, Joy L. (FAV); + 84 | 6/7/2018

We Appreciate Your Feedback...Code Blue Events at VHSO

Staff,

You are invited to participate in an online, voluntary, confidential survey provided through SurveyMonkey regarding our Code Blue processes at VHSO. As we continue to grow at VHSO and ensure best practices are in place for our Veteran population, your feedback and perspective are vital toward the decision-making processes of performance improvement and data-guided changes with our Code Blue processes, documentation and debriefing experience. All data will be kept confidential and reported in aggregate form. If you have any questions about the survey or the reporting of the results, please feel free to contact me (Jeanette Hill, MSN, RN, Quality & Performance Improvement Specialist) at extension 63155. This study has secured approval by our Research & Development (R&D) Committee, IRB Subcommittee, Central Arkansas Veteran Healthcare System (CAVHS) IRB, and AFGE Local 2201 chapter.

The link below will take you to the voluntary, confidential survey:

https://www.surveymonkey.com/r/EBPCodeBlueEventsAtVHSO

Thank you for your participation!

Jeanette Hill, MSN, RN
Office of Quality, Safety, and Value
Quality & Performance Improvement Specialist
Veteran's Health Care System of the Ozarks (VHSO)
1100 N. College Avenue
Fayetteville, Arkansas 72703
1.800.691.8387, ext. 63156

Appendix L
Standardized Leader-Driven Team Debriefing Checklist

Code Blue and Rapid Response 5-minute Team Debriefing Guide and Critique

Goal: A debriefing will be completed after all Code Blues and Rapid Responses. Nurse Managers (NM) and Off Tour Nurses Supervisors (OTNS) will facilitate debriefings.

Event Type: ☐ Rapid Response ☐ Code Blue Date/time: _____ Location: _____

Identify what went easily (if no, explain below):

Yes No N/A Communications were closed-loop, clear and heard
Yes No N/A The Team Leader was identified and did not perform a task; leadership was clear
Yes No N/A ETCO2 was monitored (if intubated)
Yes No N/A CPR feedback device (defib pads) was used to determine compression effectiveness by CPR monitor

Comments/other things that went well:

_____
_____
_____

Identify what was challenging (if yes, explain below):

Yes No N/A Communications issues
Yes No N/A Members on the team were not aware of what was going on (No Situational Awareness)
Yes No N/A There was no clear leadership (ONE Clear team Leader)
Yes No N/A No Crowd Control was provided by the Team Leader or other team members
Yes No N/A Deviation from ACLS algorithms (explain below)
Yes No N/A Compressor was not replaced every 2 minutes, No CPR Monitor Role
Yes No N/A Delay in obtaining vascular access (explain below)
Yes No N/A Additional barriers that made the event challenging (explain below)

Comments/other things that were challenging:

_____
_____
_____

Thinking about this event, identify system issues that need improvement (if yes, explain below):

Yes No N/A Dispatcher or pager issues
Yes No N/A Equipment issues
Yes No N/A Medication issues
Yes No N/A Supply issues
Yes No N/A Intubation issues
Yes No N/A Crowd control issues
Yes No N/A Delay in transporting the patient (within the hospital)
Yes No N/A Push back to make the RRT call
Yes No N/A RRT could have been called earlier

Comments/other issues that need improvement:

_____
_____
_____

Roles (if no, explain below):

Yes No N/A Team Leader/NM/OTNS assigned roles and facilitated debriefing
Yes No N/A Primary RN stayed at bedside; initially assessed the patient; available for communication
Yes No N/A Recorder documented and prompted Team Leader on algorithm (ex. time to administer medications)
Yes No N/A Defib pads were placed on the patient prior to the code team's arrival
Yes No N/A CPR quality monitored; Rhythm checks completed and CPR compressors rotated every 2 minutes
Yes No N/A NM/OTNS entered appropriate event note in CPRS and sent rhythm strips for scanning
Yes No N/A Hospitalist provided leadership during the event

Comments/other issues related roles and the team leader:

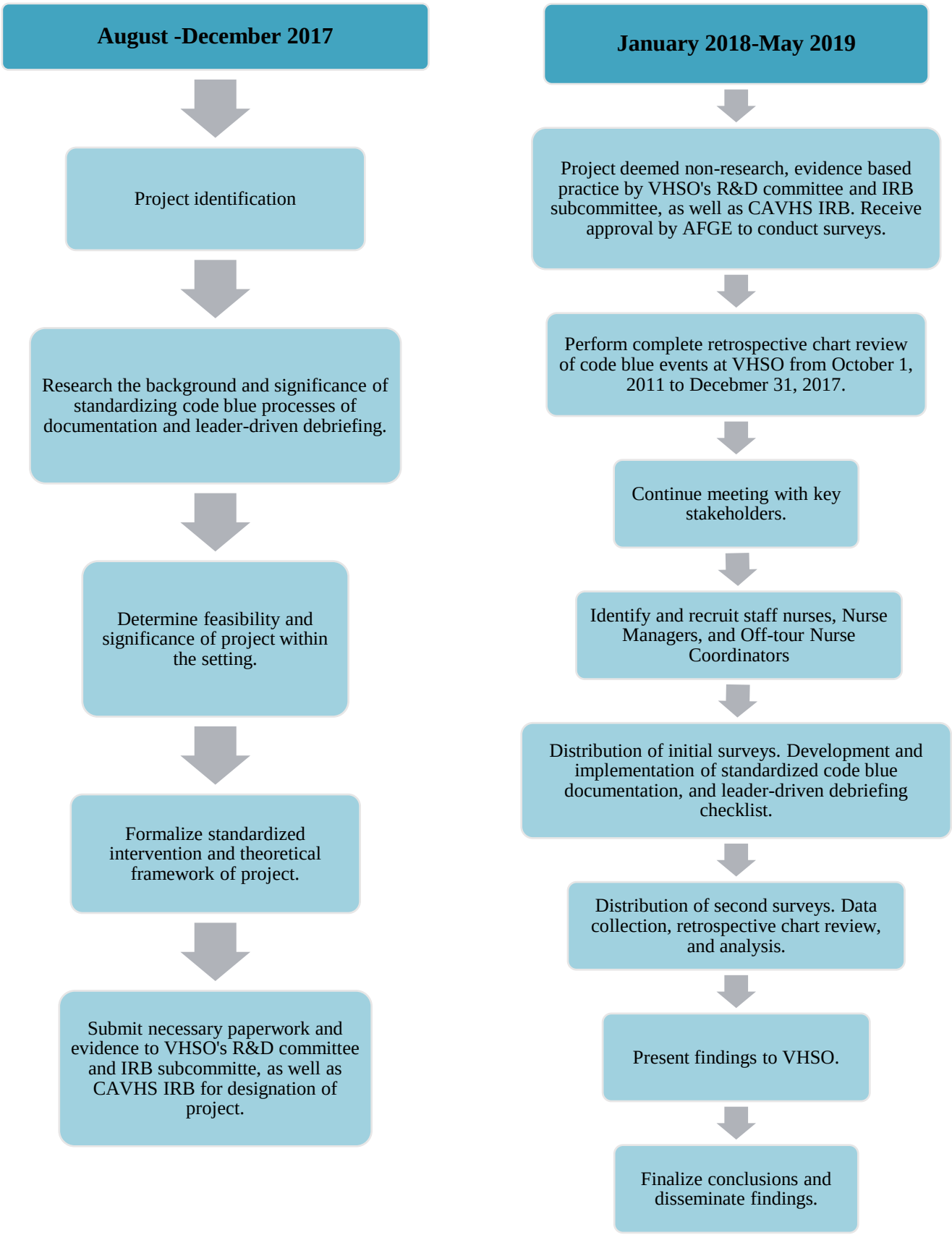
_____
_____
_____

Patient Label

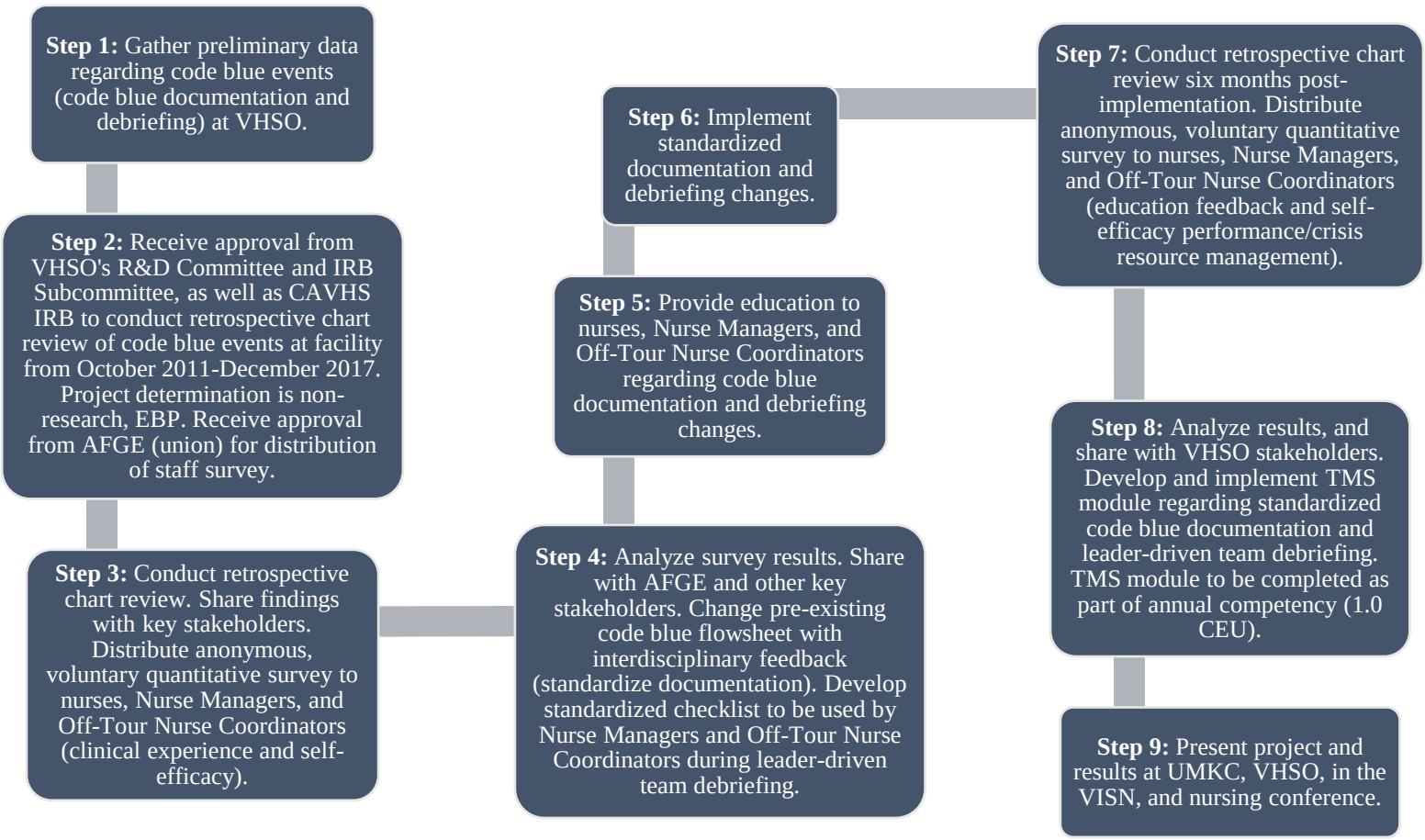
Appendix M

Logic Model for DNP Project					
Student: Jeanette Hill, DNP(c), MSN, RN					
Inquiry, PICOTS: (P) For Nurse Managers and Off-tour Nurse Coordinators/Supervisor, (I) will implementation of a standardized process for code blue events (C) versus the current practice of no standardized process (O) improve code blue documentation and leader-driven post event debriefing (T) in 6 months (S) at the Veteran's Health Care System of the Ozarks?					
Inputs	**Intervention(s)** *Activities*	**Outputs** *Participation*	**Outcomes -- Impact** *Short*	*Medium*	*Long*
Evidence, sub-topics **(1)** Standardization of Care and Process Review; **(2)** Code Blue Debriefing, Documentation, and Self-Efficacy Performance; **(3)** Self-efficacy and Nursing Management; **(4)** Cardiac Arrest Resuscitation Practice **Major Facilitators or Contributors** **(1)** Jeanette Hill; **(2)** ICU Committee; **(3)** Office of Quality, Safety, and Value; **(4)** Nursing Clinical Support; **(5)** Peer Review Committee **Major Barriers or Challenges** **(1)** Conflicting ideas about best standardized process; **(2)** Small setting, approximately 100+ RNs; **(3)** Process for change within Veteran's Health Care System typically takes longer compared to civilian health care settings.	**EBP intervention which is supported by the evidence in the Input column (brief phrase)** Implementing a standardized process for code blue documentation, leader-driven debriefings, and self-efficacy performance. **Major steps of the intervention (brief phrases)** **(1)** Retrospective chart review; **(2)** Quantitative survey (pre- and post-: experience/self-efficacy); **(3)** Develop/implement new code blue flow sheet in CPRS; **(4)** Develop/implement new code blue debriefing form to be completed by Nurse Manager/Off-tour Nurse Coordinator/Supervisor; **(5)** Develop/implement standardized checklist for the intent of a Nurse Manager or Off-tour Nurse Coordinator/Supervisor to collect performance during the pilot period; **(6)** Education provided to Nurse Managers, Off-tour Nurse Coordinators/Supervisors, and direct care nurses related to the changes through the Talent Management System at VHSO (1.0 CEU).	**The participants (subjects)** Nurse Managers, Off-tour Nurse Coordinators/Supervisors, and direct care nurses at VHSO **Site** Veteran's Health Care System of the Ozarks **Time Frame** 6 months **Consent or assent Needed** No consent or assent needed. Quantitative data collection approved by AFGE (union). Quantitative retrospective chart review approved by CAVHS IRB (EBP project is non-research). **Other person(s) collecting data (yes/no)** No **Others directly involved in consent or data collection (yes/no)** No	**(Completed during DNP Project)** **Outcome(s) to be measured** *Primary:* Code Blue documentation and leader-driven debriefing – both dependent on employee compliance *Secondary:* Self-efficacy in performance and crisis resource/nursing management **Measurement tool(s)** • Experience/Self-Efficacy survey • Checklist/Check sheet completed by Nurse Manager/Off-tour Nurse Coordinator/Supervisor • Control Chart and/or tables **Statistical analysis to be used** • A priori analysis; homogeneity of variances test (Levene test) and one-way ANOVA; simple descriptive statistics	**(After student DNP)** **Outcomes to be measured** Review compliance metrics again 6, 9 and 12 months post; Assess whether increased leader-driven team debriefing has improved overall code blue documentation and cardiopulmonary resuscitation practice. Review self-efficacy in performance and crisis resource/nursing management 6, 9 and 12 months post.	**(After student DNP)** **Outcomes that are potentials** Develop program for standardized code blue documentation and leader-driven team debriefing in other Veteran Health Care System facilities (first the VISN, followed by system-wide). Develop crisis resource management training program for direct care nurses and nursing management.

Appendix N
Project Timeline Flow



Appendix O
Intervention Participant Flow Diagram



Appendix P
Voluntary, Anonymous Quantitative Nursing Survey

U.S. Department of Veterans Affairs
Veterans Health Administration
Veterans Health Care System of the Ozarks

Evidence-Based Practice: Code Blue Events at VHSO

Nursing Experience and Self-Efficacy – 2018

1. Please specify your age group.

   ○ 20-30 years
   ○ 31-40 years
   ○ 41-50 years
   ○ 51-60 years
   ○ 61 years or older
   ○ Prefer not to answer

2. Please specify your gender.

   ○ Male
   ○ Female
   ○ Prefer not to answer

3. Please specify the highest level nursing degree you have earned.

   ○ Licensed Practical Nurse (LPN)
   ○ Associate Degree in Nursing (ADN)
   ○ Bachelor's Degree in Nursing (BSN)
   ○ Master's Degree in Nursing (MSN)
   ○ Doctor Degree in Nursing (DNP and/or PhD)
   ○ Prefer not to answer

4. How many years have you worked in the direct care nurse role at VHSO?

   ○ Less than 1 year
   ○ 1-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16 or more years
   ○ Prefer not to answer

5. If applicable, how many years have you worked in a direct care nurse role within the civilian health care sector?

   ○ Less than 1 year
   ○ 1-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16 or more years
   ○ Prefer not to answer

6. If applicable, how many years have you worked in the Nurse Manager role at VHSO?

   ○ Less than 1 year
   ○ 1-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16 or more years
   ○ Prefer not to answer

7. If applicable, how many years have you worked in the Nurse Manager or other nursing leadership role within the civilian health care sector?

   ○ Less than 1 year
   ○ 1-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16 or more years
   ○ Prefer not to answer

8. If applicable, how many years have you worked in the Off-tour Nurse Coordinator/Supervisor role at VHSO?

   ○ Less than 1 year
   ○ 1-5 years
   ○ 6-10 years
   ○ 11-15 years
   ○ 16 or more years
   ○ Prefer not to answer

9. How many Code Blue events have you responded to and/or participated in at VHSO?

   ○ 1-5
   ○ 6-10
   ○ 11-15
   ○ 16-20
   ○ 21 or more
   ○ Prefer not to answer

10. If applicable, how many Code Blue events have you responded to or participated in within the civilian health care sector?

    ○ 1-5
    ○ 6-10
    ○ 11-15
    ○ 16-20
    ○ 21 or more
    ○ Prefer not to answer

11. Have you participated in a post-Code Blue debriefing session at VHSO? If yes, please elaborate in the comments section provided (e.g., what went well or did not go well during the debriefing session, feedback on improving team participation during debriefing, etc.).

    ○ Yes
    ○ No
    ○ Prefer not to answer

    Other (please specify)

12. If applicable, please comment on your experience and concerns as a Nurse Manager or Off-tour Nurse Coordinator/Supervisor in leading a post-Code Blue debriefing session. If not applicable or you prefer not to answer, please note as such in the comment section provided.

13. Are you familiar with completing the Code Blue flow sheet in CPRS following a Code Blue event?

    ○ Yes
    ○ No
    ○ Prefer not to answer

14. Using the percentage scale, please complete questions 15-21 below. Select the percentage (%) which accurately reflects your confidence level in your ability to do the items listed. Consider the following percentage range when answering on the slider scale: 0-10% (not confident), 40-60% (moderately confident), and 90-100% (confident).

15. Identifying team roles during a Code Blue event.

0% 50% 100%

16. Functioning in the various roles during a Code Blue event (e.g., leader, recorder, medication administration, starting IV, airway, etc.).

0% 50% 100%

17. Accuracy in completing the current Code Blue flow sheet in CPRS.

0% 50% 100%

18. Process for scanning rhythm strips following a Code Blue event.

0% 50% 100%

19. Actively participating in the leader-driven post-Code Blue debriefing session.

0% 50% 100%

20. Following ACLS guidelines/algorithms cardiac arrhythmias.

0% 50% 100%

21. Identifying cardiac rhythms on the cardiac monitor (e.g., shockable versus non-shockable).

0% 50% 100%

22. Please provide additional comments below related to your experience, confidence level, areas requiring improvement, etc. If you prefer not to answer, please note as such in the comment section provided.

Gilmartin, M. & Nokes, K. (2015). A self-efficacy scale for Clinical Nurse Leaders: Results of a pilot study. *Nursing Economics, 33*(3), 133-143. *Self-efficacy questions adapted from the CNLSES measurement tool, modification by JH 2018 for course N5613*

Appendix Q
Data Collection Templates (collected in Microsoft Excel)

Retrospective Chart Review of Full Code Veterans
Deceased Code Events from October 1, 2011-December 31, 2017

Patient ID	DOB	Gender	DOD	Time	Day	Location	Provider	Service	Code Status	Comments/Missing Documentation/Debriefing	missing/inaccuracies (Y/N)

Pre-Implementation Retrospective Chart Review of Full Code Veterans
All Code Events from October 1, 2011-December 31, 2017

Patient ID	DOB	Gender	Code Status	Comments/Missing Documentation/Debriefing	missing/inaccuracies (Y/N)

Post-Implementation Retrospective Chart Review of Full Code Veterans
All Code Events from July 1, 2018-December 31, 2018

Patient ID	DOB	Gender	Code Status	Comments/Missing Documentation/Debriefing	missing/inaccuracies (Y/N)

Nursing Self-Efficacy Performance, Pre- and Post-Implementation Survey Results

Age Group	Gender	Level of Nursing Degree	Years Employment (Direct Care Nurse, VHSO)	Years Employment (Direct Care Nurse, Civilian)	Years Employment (Nurse Manager, VHSO)	Years Employment (Nurse Manager/Other Leadership, Civilian)	Years Employment (Off-Tour Nurse Coordinator/ Supervisor, VHSO	# Codes Responded to/participated in at VHSO	# Codes Responded to/participated in Civilian	Participation in Code Blue Debriefing at VHSO	Ranking of questions 15-21 on survey

Appendix R
Statistical Analysis Template (SPSS)

One-way ANOVA: Is there a relationship between self-efficacy in crisis resource and nursing management, and standardization of code blue documentation and leader-driven debriefing?

Summary Output	
Multiple R	
R Square	
Adjusted R Square	
Standard Error	
Observations/Response Back	

Significance of F and P Values					
ANOVA					
	df	*SS*	*MS*	*F*	*Significance*
	Coefficients	*Std. Error*	*P-Values*	*Lower 95%*	*Upper 95%*

Appendix S
Statistical Analysis of Variables and Outcomes

Pre-Implementation: Age, Gender and Degree

		Age Group	Gender	Highest Nursing Degree
N	Valid	48	48	48
	Missing	0	0	0
Mean		2.8333	1.7292	3.6458
Median		3.0000	2.0000	3.5000
Mode		3.00	2.00	2.00
Std. Deviation		1.05857	.53553	1.50869
Variance		1.121	.287	2.276

Pre-Implementation: Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30 years	4	8.3	8.3	8.3
	31-40 years	15	31.3	31.3	39.6
	41-50 years	18	37.5	37.5	77.1
	51-60 years	7	14.6	14.6	91.7
	61 years and older	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	15	31.3	31.3	31.3
	Female	31	64.6	64.6	95.8
	Prefer Not to Answer	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Highest Nursing Degree

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ADN	15	31.3	31.3	31.3
	BSN	9	18.8	18.8	50.0
	MSN	13	27.1	27.1	77.1
	Prefer Not to Answer	11	22.9	22.9	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Questions 4-11 and 13

		Years Direct Care Nurse VHSO	Years Direct Care Nurse Civilian	Years Nurse Manager VHSO	Years Nurse Manager/ Other Leadership Civilian	Years Off-Tour Nurse Coordinator/ Supervisor VHSO	Number Code Blue Events Responded/ Participated VHSO	Number Code Blue Events Responded/ Participated Civilian	Participated Post Code Blue Debriefing VHSO	Familiar Completing Code Blue Flow Sheet
N	Valid	48	48	48	48	48	48	48	48	48
	Missing	0	0	0	0	0	0	0	0	0
Mean		2.2917	3.7292	5.1458	4.6250	5.0625	2.6667	3.4792	1.7292	1.3542
Median		2.0000	4.0000	6.0000	6.0000	6.0000	2.0000	5.0000	2.0000	1.0000
Mode		2.00	3.00	6.00	6.00	6.00	2.00	5.00	2.00	1.00
Std. Deviation		.92157	1.31666	1.84494	1.91994	1.84974	1.53447	1.93500	.60983	.60105
Variance		.849	1.734	3.404	3.686	3.422	2.355	3.744	.372	.361

Pre-Implementation: Question 4-Years Direct Care Nurse VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	9	18.8	18.8	18.8
	1-5 years	20	41.7	41.7	60.4
	6-10 years	17	35.4	35.4	95.8
	16 or more years	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 5-Years Direct Care Nurse Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	3	6.3	6.3	6.3
	1-5 years	4	8.3	8.3	14.6
	6-10 years	15	31.3	31.3	45.8
	11-15 years	11	22.9	22.9	68.8
	16 or more years	11	22.9	22.9	91.7
	Not Applicable	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 6-Years Nurse Manager VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	8.3	8.3	8.3
	1-5 years	4	8.3	8.3	16.7
	6-10 years	3	6.3	6.3	22.9
	Not Applicable	33	68.8	68.8	91.7
	Prefer Not to Answer	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 7-Years Nurse Manager or Other Leadership Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	3	6.3	6.3	6.3
	1-5 years	8	16.7	16.7	22.9
	6-10 years	6	12.5	12.5	35.4
	16 or more years	4	8.3	8.3	43.8
	Not Applicable	24	50.0	50.0	93.8
	Prefer Not to Answer	3	6.3	6.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 8-Years Off-Tour Nurse Coordinator/Supervisor VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	8.3	8.3	8.3
	1-5 years	4	8.3	8.3	16.7
	6-10 years	4	8.3	8.3	25.0
	Not Applicable	33	68.8	68.8	93.8
	Prefer Not to Answer	3	6.3	6.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 9-Number Code Blue Events Responded/Participated VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	11	22.9	22.9	22.9
	6-10	17	35.4	35.4	58.3
	11-15	9	18.8	18.8	77.1
	16-20	3	6.3	6.3	83.3
	21 or more	4	8.3	8.3	91.7
	Prefer Not to Answer	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 10-Number Code Blue Events Responded Participated Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	15	31.3	31.3	31.3
	6-10	3	6.3	6.3	37.5
	11-15	4	8.3	8.3	45.8
	21 or more	22	45.8	45.8	91.7
	Not Applicable	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 11-Participated Post Code Blue Debriefing VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	35.4	35.4	35.4
	No	27	56.3	56.3	91.7
	Prefer Not to Answer	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 13-Familiar Completing Code Blue Flow Sheet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	70.8	70.8	70.8
	No	11	22.9	22.9	93.8
	Prefer Not to Answer	3	6.3	6.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: CNLSES Self-Efficacy Questions 15-21

		CNLSES 1	CNLSES 2	CNLSES 3	CNLSES 4	CNLSES 5	CNLSES 6	CNLSES 7
N	Valid	48	48	48	48	48	48	48
	Missing	0	0	0	0	0	0	0
Mean		4.4583	4.3333	4.0833	3.5417	2.8750	4.5417	4.4375
Median		5.0000	5.0000	4.0000	3.5000	3.0000	5.0000	5.0000
Mode		5.00	5.00	4.00	3.00	3.00	5.00	5.00
Std. Deviation		.92157	.97486	.76724	1.12908	1.28204	.71335	.96550
Variance		.849	.950	.589	1.275	1.644	.509	.932

Pre-Implementation: Question 15-CNLSES 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10% (Not Confident)	2	4.2	4.2	4.2
	50-79% (Moderately Confident)	2	4.2	4.2	8.3
	80-95% (Confident)	14	29.2	29.2	37.5
	Greater than 95% (Extremely Confident)	30	62.5	62.5	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 16-CNLSES 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10% (Not Confident)	2	4.2	4.2	4.2
	50-79% (Moderately Confident)	5	10.4	10.4	14.6
	80-95% (Confident)	14	29.2	29.2	43.8
	Greater than 95% (Extremely Confident)	27	56.3	56.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 17-CNLSES 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	12	25.0	25.0	25.0
	80-95% (Confident)	20	41.7	41.7	66.7
	Greater than 95% (Extremely Confident)	16	33.3	33.3	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 18-CNLSES 4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10% (Not Confident)	2	4.2	4.2	4.2
	11-49% (Minimally Confident)	6	12.5	12.5	16.7
	50-79% (Moderately Confident)	16	33.3	33.3	50.0
	80-95% (Confident)	12	25.0	25.0	75.0
	Greater than 95% (Extremely Confident)	12	25.0	25.0	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 19-CNLSES 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10% (Not Confident)	10	20.8	20.8	20.8
	11-49% (Minimally Confident)	6	12.5	12.5	33.3
	50-79% (Moderately Confident)	18	37.5	37.5	70.8
	80-95% (Confident)	8	16.7	16.7	87.5
	Greater than 95% (Extremely Confident)	6	12.5	12.5	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 20-CNLSES 6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11-49% (Minimally Confident)	2	4.2	4.2	4.2
	80-95% (Confident)	16	33.3	33.3	37.5
	Greater than 95% (Extremely Confident)	30	62.5	62.5	100.0
	Total	48	100.0	100.0	

Pre-Implementation: Question 21-CNLSES 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10% (Not Confident)	2	4.2	4.2	4.2
	50-79% (Moderately Confident)	4	8.3	8.3	12.5
	80-95% (Confident)	11	22.9	22.9	35.4
	Greater than 95% (Extremely Confident)	31	64.6	64.6	100.0
	Total	48	100.0	100.0	

Post-Implementation: Age, Gender, and Degree

		Age Group	Gender	Highest Nursing Degree
N	Valid	47	47	47
	Missing	0	0	0
Mean		2.8511	1.7234	3.6809
Median		3.0000	2.0000	4.0000
Mode		3.00	2.00	2.00
Std. Deviation		1.06278	.53981	1.50516
Variance		1.130	.291	2.265

Post-Implementation: Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30 years	4	8.5	8.5	8.5
	31-40 years	14	29.8	29.8	38.3
	41-50 years	18	38.3	38.3	76.6
	51-60 years	7	14.9	14.9	91.5
	61 years and older	4	8.5	8.5	100.0
	Total	47	100.0	100.0	

Post-Implementation: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	15	31.9	31.9	31.9
	Female	30	63.8	63.8	95.7
	Prefer Not to Answer	2	4.3	4.3	100.0
	Total	47	100.0	100.0	

Post-Implementation: Highest Nursing Degree

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ADN	14	29.8	29.8	29.8
	BSN	9	19.1	19.1	48.9
	MSN	13	27.7	27.7	76.6
	Prefer Not to Answer	11	23.4	23.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Questions 4-11 and 13

		Years Direct Care Nurse VHSO	Years Direct Care Nurse Civilian	Years Nurse Manager VHSO	Years Nurse Manager/ Other Leadership Civilian	Years Off-Tour Nurse Coordinator/ Supervisor VHSO	Number Code Blue Events Responded Participated VHSO	Number Code Blue Events Responded/ Participated Civilian	Participated Post Code Blue Debriefing VHSO	Familiar Completing Code Blue Flow Sheet
N	Valid	47	47	47	47	47	47	47	47	47
	Missing	0	0	0	0	0	0	0	0	0
Mean		2.2979	3.7447	5.2128	4.6596	5.1064	2.5106	3.4894	1.5106	1.1277
Median		2.0000	4.0000	6.0000	6.0000	6.0000	2.0000	5.0000	1.0000	1.0000
Mode		2.00	3.00	6.00	6.00	6.00	2.00	5.00	1.00	1.00
Std. Deviation		.93052	1.32645	1.80502	1.92553	1.84431	1.44271	1.95462	.62109	.39656
Variance		.866	1.759	3.258	3.708	3.401	2.081	3.821	.386	.157

Post-Implementation: Question 4-Years Direct Care Nurse VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	9	19.1	19.1	19.1
	1-5 years	19	40.4	40.4	59.6
	6-10 years	17	36.2	36.2	95.7
	16 or more years	2	4.3	4.3	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 5-Years Direct Care Nurse Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	3	6.4	6.4	6.4
	1-5 years	4	8.5	8.5	14.9
	6-10 years	14	29.8	29.8	44.7
	11-15 years	11	23.4	23.4	68.1
	16 or more years	11	23.4	23.4	91.5
	Not Applicable	4	8.5	8.5	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 6-Years Nurse Manager VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	8.5	8.5	8.5
	1-5 years	3	6.4	6.4	14.9
	6-10 years	3	6.4	6.4	21.3
	Not Applicable	33	70.2	70.2	91.5
	Prefer Not to Answer	4	8.5	8.5	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 7-Years Nurse Manager or Other Leadership Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	3	6.4	6.4	6.4
	1-5 years	8	17.0	17.0	23.4
	6-10 years	5	10.6	10.6	34.0
	16 or more years	4	8.5	8.5	42.6
	Not Applicable	24	51.1	51.1	93.6
	Prefer Not to Answer	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 8-Years Off-Tour Nurse Coordinator/Supervisor VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	8.5	8.5	8.5
	1-5 years	4	8.5	8.5	17.0
	6-10 years	3	6.4	6.4	23.4
	Not Applicable	33	70.2	70.2	93.6
	Prefer Not to Answer	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 9-Number Code Blue Events Responded Participated VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	12	25.5	25.5	25.5
	6-10	17	36.2	36.2	61.7
	11-15	9	19.1	19.1	80.9
	16-20	3	6.4	6.4	87.2
	21 or more	3	6.4	6.4	93.6
	Prefer Not to Answer	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 10-Number Code Blue Events Responded Participated Civilian

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	15	31.9	31.9	31.9
	6-10	3	6.4	6.4	38.3
	11-15	3	6.4	6.4	44.7
	21 or more	22	46.8	46.8	91.5
	Not Applicable	4	8.5	8.5	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 11-Participated Post Code Blue Debriefing VHSO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	26	55.3	55.3	55.3
	No	18	38.3	38.3	93.6
	Prefer Not to Answer	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 13-Familiar Completing Code Blue Flow Sheet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	42	89.4	89.4	89.4
	No	4	8.5	8.5	97.9
	Prefer Not to Answer	1	2.1	2.1	100.0
	Total	47	100.0	100.0	

Post-Implementation: CNLSES Self-Efficacy Questions 15-21

		CNLSES 1	CNLSES 2	CNLSES 3	CNLSES 4	CNLSES 5	CNLSES 6	CNLSES 7
N	Valid	47	47	47	47	47	47	47
	Missing	0	0	0	0	0	0	0
Mean		4.7872	4.7234	4.8936	4.8936	4.8085	4.7872	4.7447
Median		5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000
Mode		5.00	5.00	5.00	5.00	5.00	5.00	5.00
Std. Deviation		.54916	.61510	.31166	.31166	.49512	.50803	.53030
Variance		.302	.378	.097	.097	.245	.258	.281

Post-Implementation: Question 15-CNLSES 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	3	6.4	6.4	6.4
	80-95% (Confident)	4	8.5	8.5	14.9
	Greater than 95% (Extremely Confident)	40	85.1	85.1	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 16-CNLSES 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	4	8.5	8.5	8.5
	80-95% (Confident)	5	10.6	10.6	19.1
	Greater than 95% (Extremely Confident)	38	80.9	80.9	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 17-CNLSES 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80-95% (Confident)	5	10.6	10.6	10.6
	Greater than 95% (Extremely Confident)	42	89.4	89.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 18-CNLSES 4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80-95% (Confident)	5	10.6	10.6	10.6
	Greater than 95% (Extremely Confident)	42	89.4	89.4	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 19-CNLSES 5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	2	4.3	4.3	4.3
	80-95% (Confident)	5	10.6	10.6	14.9
	Greater than 95% (Extremely Confident)	40	85.1	85.1	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 20-CNLSES 6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	2	4.3	4.3	4.3
	80-95% (Confident)	6	12.8	12.8	17.0
	Greater than 95% (Extremely Confident)	39	83.0	83.0	100.0
	Total	47	100.0	100.0	

Post-Implementation: Question 21-CNLSES 7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50-79% (Moderately Confident)	2	4.3	4.3	4.3
	80-95% (Confident)	8	17.0	17.0	21.3
	Greater than 95% (Extremely Confident)	37	78.7	78.7	100.0
	Total	47	100.0	100.0	

Pre-/Post-Implementation: Age, Gender and Degree

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Age Group	Pre-Implementation Survey Response	48	2.8333	1.05857	.15279	2.5260	3.1407	1.00	5.00
	Post-Implementation Survey Response	47	2.8511	1.06278	.15502	2.5390	3.1631	1.00	5.00
	Total	95	2.8421	1.05504	.10824	2.6272	3.0570	1.00	5.00
Gender	Pre-Implementation Survey Response	48	1.7292	.53553	.07730	1.5737	1.8847	1.00	3.00
	Post-Implementation Survey Response	47	1.7234	.53981	.07874	1.5649	1.8819	1.00	3.00
	Total	95	1.7263	.53479	.05487	1.6174	1.8353	1.00	3.00
Highest Nursing Degree	Pre-Implementation Survey Response	48	3.6458	1.50869	.21776	3.2078	4.0839	2.00	6.00
	Post-Implementation Survey Response	47	3.6809	1.50516	.21955	3.2389	4.1228	2.00	6.00
	Total	95	3.6632	1.49901	.15380	3.3578	3.9685	2.00	6.00

Pre-/Post-Implementation: Test for Homogeneity of Variances-Age, Gender and Degree

	Levene Statistic	df1	df2	Sig.
Age Group	.001	1	93	.975
Gender	.012	1	93	.914
Highest Nursing Degree	.003	1	93	.957

Pre-/Post-Implementation: ANOVA-Age, Gender and Degree

		Sum of Squares	df	Mean Square	F	Sig.
Age Group	Between Groups	.007	1	.007	.007	.935
	Within Groups	104.624	93	1.125		
	Total	104.632	94			
Gender	Between Groups	.001	1	.001	.003	.958
	Within Groups	26.883	93	.289		
	Total	26.884	94			
Highest Nursing Degree	Between Groups	.029	1	.029	.013	.910
	Within Groups	211.192	93	2.271		
	Total	211.221	94			

Pre-/Post-Implementation: Questions 4-11 and 13

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Years Direct Care Nurse VHSO	Pre-Implementation Survey Response	48	2.2917	.92157	.13302	2.0241	2.5593	1.00	5.00
	Post-Implementation Survey Response	47	2.2979	.93052	.13573	2.0247	2.5711	1.00	5.00
	Total	95	2.2947	.92107	.09450	2.1071	2.4824	1.00	5.00
Years Direct Care Nurse Civilian	Pre-Implementation Survey Response	48	3.7292	1.31666	.19004	3.3468	4.1115	1.00	6.00
	Post-Implementation Survey Response	47	3.7447	1.32645	.19348	3.3552	4.1341	1.00	6.00
	Total	95	3.7368	1.31449	.13486	3.4691	4.0046	1.00	6.00
Years Nurse Manager VHSO	Pre-Implementation Survey Response	48	5.1458	1.84494	.26629	4.6101	5.6815	1.00	7.00
	Post-Implementation Survey Response	47	5.2128	1.80502	.26329	4.6828	5.7427	1.00	7.00
	Total	95	5.1789	1.81588	.18631	4.8090	5.5489	1.00	7.00

Years Nurse Manager/ Other Leadership Civilian	Pre-Implementation Survey Response	48	4.6250	1.91994	.27712	4.0675	5.1825	1.00	7.00
	Post-Implementation Survey Response	47	4.6596	1.92553	.28087	4.0942	5.2249	1.00	7.00
	Total	95	4.6421	1.91253	.19622	4.2525	5.0317	1.00	7.00
Years Off-Tour Nurse Coordinator/Supervisor VHSO	Pre-Implementation Survey Response	48	5.0625	1.84974	.26699	4.5254	5.5996	1.00	7.00
	Post-Implementation Survey Response	47	5.1064	1.84431	.26902	4.5649	5.6479	1.00	7.00
	Total	95	5.0842	1.83734	.18851	4.7099	5.4585	1.00	7.00
Number Code Blue Events Responded/Participated VHSO	Pre-Implementation Survey Response	48	2.6667	1.53447	.22148	2.2211	3.1122	1.00	6.00
	Post-Implementation Survey Response	47	2.5106	1.44271	.21044	2.0870	2.9342	1.00	6.00
	Total	95	2.5895	1.48392	.15225	2.2872	2.8918	1.00	6.00
Number Code Blue Events Responded Participated Civilian	Pre-Implementation Survey Response	48	3.4792	1.93500	.27929	2.9173	4.0410	1.00	6.00
	Post-Implementation Survey Response	47	3.4894	1.95462	.28511	2.9155	4.0633	1.00	6.00
	Total	95	3.4842	1.93437	.19846	3.0902	3.8783	1.00	6.00
Participated Post Code Blue Debriefing VHSO	Pre-Implementation Survey Response	48	1.7292	.60983	.08802	1.5521	1.9062	1.00	3.00

	Post-Implementation Survey Response	47	1.5106	.62109	.09060	1.3283	1.6930	1.00	3.00
	Total	95	1.6211	.62192	.06381	1.4944	1.7477	1.00	3.00
Familiar Completing Code Blue Flow Sheet	Pre-Implementation Survey Response	48	1.3542	.60105	.08675	1.1796	1.5287	1.00	3.00
	Post-Implementation Survey Response	47	1.1277	.39656	.05784	1.0112	1.2441	1.00	3.00
	Total	95	1.2421	.52014	.05337	1.1361	1.3481	1.00	3.00

Pre-/Post-Implementation: Test for Homogeneity of Variances-Questions 4-11 and 13

	Levene Statistic	df1	df2	Sig.
Years Direct Care Nurse VHSO	.008	1	93	.927
Years Direct Care Nurse Civilian	.002	1	93	.969
Years Nurse Manager VHSO	.109	1	93	.742
Years Nurse Manager/Other Leadership Civilian	.003	1	93	.958
Years Off-Tour Nurse Coordinator/Supervisor VHSO	.027	1	93	.871
Number Code Blue Events Responded/Participated VHSO	.279	1	93	.599
Number Code Blue Events Responded Participated Civilian	.048	1	93	.827
Participated Post Code Blue Debriefing VHSO	.699	1	93	.405
Familiar Completing Code Blue Flow Sheet	17.071	1	93	.000

Pre-/Post-Implementation: ANOVA-Questions 4-11 and 13

		Sum of Squares	df	Mean Square	F	Sig.
Years Direct Care Nurse VHSO	Between Groups	.001	1	.001	.001	.974
	Within Groups	79.746	93	.857		
	Total	79.747	94			
Years Direct Care Nurse Civilian	Between Groups	.006	1	.006	.003	.955
	Within Groups	162.415	93	1.746		
	Total	162.421	94			
Years Nurse Manager VHSO	Between Groups	.106	1	.106	.032	.859
	Within Groups	309.852	93	3.332		
	Total	309.958	94			
Years Nurse Manager/Other Leadership Civilian	Between Groups	.028	1	.028	.008	.930
	Within Groups	343.803	93	3.697		
	Total	343.832	94			
Years Off-Tour Nurse Coordinator/Supervisor VHSO	Between Groups	.046	1	.046	.013	.908
	Within Groups	317.281	93	3.412		
	Total	317.326	94			
Number Code Blue Events Responded Participated VHSO	Between Groups	.578	1	.578	.260	.611
	Within Groups	206.411	93	2.219		
	Total	206.989	94			
Number Code Blue Events Responded/Participated Civilian	Between Groups	.002	1	.002	.001	.980
	Within Groups	351.724	93	3.782		
	Total	351.726	94			
Participated Post Code Blue Debriefing VHSO	Between Groups	1.134	1	1.134	2.994	.087
	Within Groups	35.224	93	.379		

	Total	36.358	94			
Familiar Completing Code Blue Flow Sheet	Between Groups	1.218	1	1.218	4.680	.033
	Within Groups	24.213	93	.260		
	Total	25.432	94			

Pre-/Post-Implementation: CNLSES Self-Efficacy Questions 15-21

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
CNLSES 1	Pre-Implementation Survey Response	48	4.4583	.92157	.13302	4.1907	4.7259	1.00	5.00
	Post-Implementation Survey Response	47	4.7872	.54916	.08010	4.6260	4.9485	3.00	5.00
	Total	95	4.6211	.77431	.07944	4.4633	4.7788	1.00	5.00
CNLSES 2	Pre-Implementation Survey Response	48	4.3333	.97486	.14071	4.0503	4.6164	1.00	5.00
	Post-Implementation Survey Response	47	4.7234	.61510	.08972	4.5428	4.9040	3.00	5.00
	Total	95	4.5263	.83592	.08576	4.3560	4.6966	1.00	5.00
CNLSES 3	Pre-Implementation Survey Response	48	4.0833	.76724	.11074	3.8606	4.3061	3.00	5.00
	Post-Implementation Survey Response	47	4.8936	.31166	.04546	4.8021	4.9851	4.00	5.00
	Total	95	4.4842	.71255	.07311	4.3391	4.6294	3.00	5.00

CNLSES 4	Pre-Implementation Survey Response	48	3.5417	1.12908	.16297	3.2138	3.8695	1.00	5.00
	Post-Implementation Survey Response	47	4.8936	.31166	.04546	4.8021	4.9851	4.00	5.00
	Total	95	4.2105	1.07084	.10987	3.9924	4.4287	1.00	5.00
CNLSES 5	Pre-Implementation Survey Response	48	2.8750	1.28204	.18505	2.5027	3.2473	1.00	5.00
	Post-Implementation Survey Response	47	4.8085	.49512	.07222	4.6631	4.9539	3.00	5.00
	Total	95	3.8316	1.37340	.14091	3.5518	4.1114	1.00	5.00
CNLSES 6	Pre-Implementation Survey Response	48	4.5417	.71335	.10296	4.3345	4.7488	2.00	5.00
	Post-Implementation Survey Response	47	4.7872	.50803	.07410	4.6381	4.9364	3.00	5.00
	Total	95	4.6632	.62926	.06456	4.5350	4.7913	2.00	5.00
CNLSES 7	Pre-Implementation Survey Response	48	4.4375	.96550	.13936	4.1571	4.7179	1.00	5.00
	Post-Implementation Survey Response	47	4.7447	.53030	.07735	4.5890	4.9004	3.00	5.00
	Total	95	4.5895	.79218	.08128	4.4281	4.7508	1.00	5.00

Pre-/Post-Implementation: Test of Homogeneity of Variances- CNLSES Self-Efficacy Questions 15-21

	Levene Statistic	df1	df2	Sig.
CNLSES 1	8.550	1	93	.004
CNLSES 2	7.885	1	93	.006
CNLSES 3	31.288	1	93	.000
CNLSES 4	70.062	1	93	.000
CNLSES 5	28.240	1	93	.000
CNLSES 6	7.529	1	93	.007
CNLSES 7	9.769	1	93	.002

Pre-/Post-Implementation: ANOVA-CNLSES Self-Efficacy Questions 15-21

		Sum of Squares	df	Mean Square	F	Sig.
CNLSES 1	Between Groups	2.569	1	2.569	4.442	.038
	Within Groups	53.789	93	.578		
	Total	56.358	94			
CNLSES 2	Between Groups	3.613	1	3.613	5.414	.022
	Within Groups	62.071	93	.667		
	Total	65.684	94			
CNLSES 3	Between Groups	15.592	1	15.592	45.123	.000
	Within Groups	32.135	93	.346		
	Total	47.726	94			
CNLSES 4	Between Groups	43.405	1	43.405	62.696	.000
	Within Groups	64.385	93	.692		
	Total	107.789	94			
CNLSES 5	Between Groups	88.779	1	88.779	93.265	.000
	Within Groups	88.527	93	.952		
	Total	177.305	94			
CNLSES 6	Between Groups	1.432	1	1.432	3.721	.057
	Within Groups	35.789	93	.385		
	Total	37.221	94			
CNLSES 7	Between Groups	2.241	1	2.241	3.672	.058
	Within Groups	56.749	93	.610		
	Total	58.989	94			