The Use of High Fidelity Simulation to Improve Communication Skills among Rapid Response Team Nurses

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Table of Contents

Abstract

Purpose: Rapid Response Teams (RRTs) are an important element in a hospital's quality and safety program that have been shown to decrease mortality and cardiac arrests. Communication has been identified by The Joint Commission as the third root cause of sentinel events in hospitals. High fidelity simulation (HFS) is used throughout the nursing arena as a safe means to educate and practice necessary skills. Equipping RRTs with effective communication skills to further enhance their performance will greatly impact patient care. The purpose of this study was to determine if participation in an educational intervention consisting of HFS by RRT nurses promoted the intent to use a structured communication tool when reporting to providers.

Research Question: Did participation in an educational intervention by HFS with RRT nurses in a community hospital increase their intent to use a structured communication tool when reporting to providers?

Methods: Participants from the RRT consisting of nurses from a Medical Intensive Care Unit at a community hospital participated in two simulations that closely resembled an RRT call in which a patient was deteriorating. Education about the communication tool, I-PASS-the-BATON, from AHRQ's teamSTEPPS® ,was conducted between each simulation. Participants completed a doctoral student developed survey after the second simulation to assess their intent to use the communication tool, I-PASS-the-BATON.

Findings: Twelve Rapid Response Team Nurses participated in the study in which 91.7% had the intention to use I PASS the BATON in future RRT calls.

Conclusions: Participation in HFS that included instruction on how to use a structured communication tool by RRT nurses did effect their intent to use the instrument. More study is

needed due to small sample size to determine if this will promote effective communication skills among RRT nurses and maintain competencies.

Key Words: Rapid Response Team, Communication, High Fidelity Simulation

Introduction

Rapid Response Teams (RRT) are an important element in the quality and safety movement that accelerated in response to the Institute of Medicine's (IOM) reports, "To Err is Human: Building a Safer Health System" (2000) and "Crossing the Quality Chasm" (2001). Since these publications, many nonprofit organizations, professional societies and government agencies have promoted programs to decrease medical errors, improve safety, and optimize patient outcomes. The Institute for Healthcare Improvement (IHI) has launched two campaigns to save lives and decrease medical errors. In 2005, the IHI began the 100,000 Lives Campaign that was aimed to decrease deaths caused by medical errors. In 2006, the IHI broadened this challenge to the 5 Million Lives Campaign. One of the six key interventions that was proposed to achieve this goal was implementation of RRTs in every hospital. The aim was that RRTs would be activated at the first sign of patient decline (Institute for Healthcare Improvement). In 2008, the Joint Commission added RRTs into their national patient safety goals as one means to provide access to specially trained individuals in the setting of clinical deterioration.

RRTs, also known as Medical Emergency Teams (METs), are described as, "When a patient demonstrates signs of imminent clinical deterioration, a team of providers is summoned to the bedside to immediately assess and treat the patient with the goal of preventing intensive care unit transfer, cardiac arrest, or death" (Agency for Healthcare Research and Quality [AHRQ], 2017). The structure of the RRT varies depending on the healthcare system. The team may consist of one Intensive Care Unit (ICU) nurse, a resident, a respiratory therapist, and the bedside nurse. In some systems, the RRT is comprised of only one ICU nurse that works alongside the bedside nurse (IHI, 2008; Maharaji, Raffaele, & Wendon, 2015). Despite the

specific configuration of the RRT, teamwork and especially communication within the RRT and between the RRT and the bedside nurse is crucial.

Since the implementation of RRTs, many studies have shown the benefits of RRTs, education of bedside nurses to activate the teams, and various early warning tools to indicate a clinical deterioration of a patient. A systematic review of 29 studies published between January 1,1990 to December 31, 2013 involving various outcomes of RRT, indicated that the implementation of RRTs was associated with lower hospital mortality and decreased cardiac arrests (Maharaji et al., 2015).

Along with the evidence that RRTs increase patient safety and reduces mortality, there are also qualitative benefits such as increased bedside nurse satisfaction, education opportunities for bedside nurses, perception of improvement in patient safety, and improved community perceptions of the hospital (Stolldorf, 2016; Smith & McSweeney, 2017). A qualitative study of 27 nurse executives across 15 hospitals showed that RRTs produce positive patient outcomes, provide support for members of the healthcare team, allow for collaboration and mutual respect, and promote a culture of quality and safety (Smith & McSweeney, 2017).

Communication is an important skill for effective teams and several organizations have developed programs or standards. The American Association of Critical-Care Nurses (AACN) issued the second edition of the Healthy Work Environment Standards in 2016 in which skilled communication is a key standard. The IHI published, “Getting Started Kit: Rapid Response Teams How-To Guide” in 2008 that defined characteristics of a good RRT team member including strong communication skills for both physicians and nurses. The AHRQ formed a teamwork program, called “teamSTEPPS®” created specifically for healthcare professionals (2015). One of the main goals of “teamSTEPPS®”is to improve communication and team skills

for more optimal outcomes. The use of several structured communication tools, such as SBAR (Situation, Background, Assessment, and Recommendation) and I-PASS-the-BATON are reported in the "teamSTEPPS®" curriculum as means to have effective communication skills with members of a healthcare team.

In 2016, The Joint Commission published statistics about sentinel events that occurred between 1995 to 2015. Communication was the third highest root cause of these events. Failure to accurately communicate was evident between staff, administration, and/or patients. McCrory et al. (2012) and Kaplan et al. (2011) recognized the importance of effective communication for RRTs. They both conducted studies aiming to improve communication in RRTs by the use of high fidelity simulation (HFS). Experts in simulation advocate for the use of HFS as means to improve communication among teams especially those involved in improving patient safety (Gallo, 2015).

Nurse educators started using an early form of simulation in 1911 with a mannequin to teach basics such as turning and positioning. Simulation has progressed from the use of a simple mannequin that looks like the shape of a human to a computerized lifelike mannequin that looks, sounds, and moves just like a human. HFS is simulation that closely resembles a realistic environment to achieve optimal learning outcomes through the use of a computerized mannequin or other equipment needed to replicate a real-life situation (Jefferies, 2005). It wasn't until the 1990s that HFS became popular in healthcare through the availability of commercially sold HFS mannequins.

Simulation has been used to educate nursing students, professional nurses, and rapid response nurses (Jeppesen, Christiansen, & Frederiksen, 2017; Shin, Park, & Kim, 2015; Theilen, Fraser, Jones, Leonard & Simpson, 2017). A meta-analysis of 20 studies indicated that

simulation improved learning outcomes in professional nurses compared to traditional education (Shin et al, 2014). Theilen et al. (2017) completed weekly simulations for a pediatric medical emergency team. After a three-year time period in which members attended eight to ten simulations a year, response to deteriorating patients was improved. Lewis, Strachan, and Smith (2012) completed a review of 16 articles that involved practicing nurses and midwives who used simulation as means for education. They specifically reviewed non-technical skills such as teamwork, communication, and decision making during simulation. They concluded that simulation as an educational strategy can be used to improve communication skills. Aebersold (2016) linked simulation to patient safety as an effective means to educate and train critical behaviors such as communication and skills needed in a successful team.

The use of RRTs in the acute care setting is supported by empiric data and national quality bodies (IHI, AHRQ). Communication is recognized as a critical skill among RRT members and simulation has been shown as an effective way to educate members of RRTs (Jeppesen et al., 2017; Shin et al., 2015; Theilen et al., 2017). However, few studies were found that reported on the effect of HFS on communication among RRT nurses. Therefore, the purpose of this study was to determine if participation in an educational intervention in HFS format by nurses on a RRT promoted the use of a structured communication tool. Specifically, did participation in a HFS by RRT nurses in a community hospital increase their intent to use a structured communication tool, I-PASS-the-BATON, when reporting to providers?

Review of the Literature

A systematic review of literature was completed to determine what is known about the use of HFS to improve communication with structured tools such as SBAR or I- PASS-the-BATON and other communication tools to use during a RRT event. Two electronic databases,

Pubmed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) were used. Search terms included, ("Hospital Rapid Response Team" OR "Medical Emergency Team" OR "Code Team") AND simulation AND communication. The Pubmed search included mesh terms, specific key words used to index journal articles in a search engine, along with the key terms. Synonyms, including code team, for rapid response team were used to capture more articles. Only academic sources were used and all levels of evidence were included. Other inclusion criteria included: year of publication from 2008-2018, English only, all age groups of medical professionals and patient population. Exclusion criteria included those articles that studied activation of RRTs and not team dynamics.

Initially, 111 articles were selected by inclusion criteria. A title review was completed of the articles that led to elimination of 90 articles. An abstract review was completed on 21 articles resulting in nine articles for full text review. Two of the nine were eliminated, leaving seven (McCrory, Aboumatar, Custer, Yang, & Hunt, 2012; Delac, Blazier, Daniel, & N-Wilfong, 2013; Kaplan, Holmes, Mott, & Atallah, 2011; Hirokawa et al., 2012; Su et al., 2014; Clark, Fisher, Arafeh, & Druzin, 2010; Beebe, Bawel-Brinkley, & O'Leary-Kelley, 2012) for final literature review (Table 1). The PRISMA Flow diagram is shown in Figure 1.

Three articles used a handoff tool such as SBAR as means to evaluate communication during HFS. McCrory et al. (2012) studied the use of a handoff tool by pediatric interns. The interns attended one simulation before 45 minutes of debriefing and education on the handoff tool and then completed the second simulation. The investigators concluded that the interns performed more components of the handoff tool in a timelier manner after education on the handoff tool. Interns were rated on a maximum score of 10 with 10 meaning the intern discussed all aspects of handoff tool with appropriate organization of the information as well. The study's

results showed a significant increase in the amount of information presented and a significant improvement in organization of the handoff. The mean scores on their evaluation tool indicated 3.1 out of 10 for pre-intervention vs. 7.8 out of 10 for post intervention ($p < .001$). They concluded that the educational intervention of HFS improved the use of the communication tool during emergent situations. Delac et al., (2013) studied the effect of simulation on medical surgical nurses who responded to codes within a hospital setting. Nurses completed two scenarios in which patients deteriorated to the point of requiring cardiopulmonary resuscitation (CPR). A pre-and post-survey of participants showed a 20.4% increase in confidence about their hand off communication after the second simulation. Kaplan et al. (2011) used the SBAR handoff tool to evaluate communication among a team consisting of nursing students and emergency nurse practitioner students in a pediatric simulation of a child who experienced clinical deterioration and then arrested. Subjects reported a perception of increased communication skills after the simulation.

Communication skills in nursing students were the focus of two studies. As previously discussed Kaplan et al (2011) performed one pediatric mock code simulation that included bachelor of science in nursing (BSN) nursing students as the team member and emergency nurse practitioner (ENP) students as the leader. Each group was given materials prior to the simulation to study based on their role that they played. Forty-three BSN students were given a 4- hour training using "teamSTEPPS®" and the 12 ENP students were given a script detailing their role in the simulation, "teamSTEPPS®" training, and a mock code preparatory class. A pre-and post-survey was completed. Overall positive results were noted about improved communication and confidence after completion of the HFS. Confidence levels for the BSN group increased from 72.1% to 97.7% and in the ENP group 80.65% to 100%.

Hirokawa et al. (2012) studied 12 junior students in a BSN program who participated in a simulation of a cardiac patient deteriorating to cardiac arrest. They measured utterances and behaviors while undergoing the simulation. They defined utterances as conversation or directions made to other team members and behaviors as nonverbal actions completed. These were measured in relation to assessment, diagnosis, planning, implementation, and evaluation. A significant positive relationship was shown between the team performance and the amount of utterances and behaviors that were about implementation ($r = 0.95$, $P = <0.05$).

Su et al. (2014) evaluated the time to deploy extracorporeal membrane oxygenation (ECMO) in pediatrics before and after the team underwent a simulation of the process. Three teams were necessary to work together to achieve successful deployment; the ICU team, surgical team, and ECMO team involving a total of 16 roles. Participants completed a series of eight simulations over 36 months. The median deployment time before the simulation intervention was 51 minutes and after the simulation intervention was 40 minutes ($p = 0.018$). Effective communication was essential to completing the task in a timely manner. Therefore, one might infer that the simulation intervention improved communication resulting in a faster deployment time.

Clark et al. (2010) used low fidelity simulation with a postpartum hemorrhage patient to improve team function during a time when a patient is rapidly deteriorating. The researchers were attempting to find successful ways to improve team function during emergency situations. They focused on improving communication through the use of SBAR, identification of the leader, and medication knowledge. No inferential statistics were completed, however they indicated that they have had positive results from the simulation by staff feedback stating that

they have seen an improvement in the way the team functions and was communicating better due to the simulation training.

Beebe et al. (2012) was the only study found in this review that focused purely on a RRT examining teamwork and communication. Eight RRT events were observed using two tools addressing the leader, situational monitoring, communication, and mutual support. Each member of the team completed a survey about team function. Results showed that communication needed to improve between the team leader, members, and bedside nurse indicated by low scores upon assessment.

Conclusions

A significant body of work exists in the study of the effects of HFS on students but few studies were found on the effects of HFS on the communication skills of members of RRT. Of the five studies (McCrory et al., 2012; Delac et al., 2013; Kaplan et al., 2011; Hirokawa et al., 2012; Clark et al., 2010) found in the literature search, all reported a positive improvement in communication after team participation in simulation. The simulation structure varied so that some studies included only one simulation and others included multiple simulations scenarios over a longer period of time. The number of scenarios did not change the overall results in these five studies, however McCrory et al (2012) reported the strongest statistical outcome ($p < .001$) in their study of the impact of the two simulations on pediatric interns' use of structured communication handoff tools.

All but one study (Beebe, Bawel-Brinkley, & O'Leary-Kelley, 2012) measured team performance by either a checklist or an algorithm such as Advanced Cardiac Life Support or a handoff tool such as SBAR. These findings support the use of a structured communication tool for RRTs to follow that may improve communication skills. Two studies, Kaplan et al, (2011) &

Beebe et al. (2012), used "teamSTEPPS®" as an educational framework for improving communication skills among team members.

The literature review showed a gap in the methods used to increase communication skills among RRT nurses. There were no studies found that focused on the integration of a structured communication tool as part of HFS to improve communication specifically among RRT nurses or between RRT nurses and providers.

Theoretical Framework

According to the International Nursing Association for Clinical Simulation and Learning (INACSL, 2016) best practice simulation for inter professional education, the simulation should be based on an adult learning theory for best outcome. The adult learning model that this project was based on was Kolb's Experiential Learning Process (1984). Kolb described learning as a four-step process of converting experiences into knowledge. Initially, a person has an experience, reflects on that experience, gains new knowledge, and then utilizes this new knowledge when encountering the next similar experience.

This study was also based on Jefferies Simulation Framework (2005). This framework includes five major aspects: teacher characteristics, student characteristics, educational practices, design of the simulation, and outcomes. Learning from simulation is a student-led activity in which the student must be motivated to produce positive outcomes. Learning also requires feedback from an instructor or peer, adhering to appropriate timeframes, collaborative learning with colleagues, and meets many different learning styles. Other critical features include a structured design with clear objectives, true to life simulations, attention to complexity, and inclusion of cues in the simulation. Debriefing is key in which theory is linked to practice and students discuss the application of the simulation. The five outcomes of simulation according to

Jefferies (2005) are knowledge, skill performance, learner satisfaction, critical thinking, and self-confidence.

Kolb's Experiential Learning Process (1984) and Jefferies (2005) framework were used to design this study on the effects of an educational intervention consisting of HFS on the intent to use a structured communication tool by RRT nurses. The simulation was designed using principles from Kolb's and Jefferies' framework. Kolb's four phases of initial experience, reflection, learning new skills, and then repeating the simulation along with design, clear objectives, real life patient rooms, and high level debriefing were integrated in the procedures.

Methods

Definition of Terms

Rapid response team. A team of ICU nurses who are trained to respond to emergent patient situations in which patients are showing signs of clinical deterioration outside the ICU setting with the goal to prevent ICU transfer, cardiac arrest or death.

Rapid response team nurses. A member of the Medical Intensive Care Unit (MICU) who has two years of critical care experience, certified in Advanced Cardiac Life Support (ACLS) and Basic Life Support (BLS), and has completed the course Fundamentals of Critical Care Support (FCCS) along with orientation to the role.

High fidelity simulation. Simulation that closely resembles a realistic environment to achieve optimal learning outcomes through the use of a computerized mannequin or other equipment needed to replicate a real-life situation (Jefferies, 2005).

Structured communication tool. An organized set of words to trigger the user to discuss a certain aspect of the patient's status with another member of the care team such as the hospitalist.

Research Design

This study was a quality improvement project that used a descriptive analysis of the effect of participation by RRT nurses in an education intervention using a HFS format that included instruction in the use of the structured communication tool, I- PASS-the-BATON. Post intervention data was collected and a quantitative, descriptive analysis was completed. Although SBAR and I- PASS-the-BATON were both created by AHRQ and there is more evidence in the literature about SBAR, I-PASS-the-BATON was used due to the practice site's negative bias towards SBAR.

Sample

A convenience sample of 25 nurses who worked in the MICU of a rural, community hospital in southwest Virginia and were members of the RRT were asked to participate over a 4-week time period between August to September 2018. Inclusion criteria were: any currently practicing RRT nurse in the MICU at the practice site who had completed the Fundamental Critical Care Support class, with at least two years of critical care experience. Exclusion criteria were: travel nurses and MICU nurses not oriented to the RRT role.

Setting

The setting was a nonprofit, 358 bed level II trauma center Magnet® certified, rural, community hospital. An average of 207 RRT calls occurred monthly between the years 2015 and 2018. In 2017, there was a monthly average of 238 RRT calls. The simulation took place in the hospital's simulation center. The rooms were setup to closely resemble the rooms on the medical surgical floors at the hospital. Other equipment used in the simulation included a computer controlled mannequin for HFS (Laerdal 3G), IV fluid, IV fluid tubing, vital sign monitoring system, imitation blood, and peripheral IV equipment.

Procedures

Recruitment. Prior to recruitment of participants, this project was sent for review by the human resources department at the practice site for approval (Appendix A). Once approval was granted, this project was submitted for review by the Institutional Review Board (IRB) at the doctoral student's university and at the clinical site (Appendix B). After both boards deemed this project IRB exempt, recruitment of subjects was begun. Announcements of the study were placed on a private social media page for the MICU and flyers were posted in the MICU breakroom and bulletin board. Due to the doctoral student not being able to attend, a representative for the doctoral student attended monthly MICU staff meetings to discuss the project with staff. Points toward the Nursing Engagement Program of the practice site was rewarded for each nurse that participated. The Nursing Engagement Program rewards nurses who participate in activities at the practice site with a differential added to their hourly pay. In addition, an incentive of a 10 dollar gift card to a local coffee shop was given to each participant who completed the study. Light refreshments and drinks were provided on the day of the study. The participant attended the study on their day off. Each participant signed up for a specific time slot electronically. Reminders of the study were sent by electronic mail and posted on the private MICU social media page two weeks prior, one week prior, and then the day before the study. If a participant did not show up then they were called and asked to reschedule if possible.

Simulation scenario. A HFS scenario of a medical-surgical patient demonstrating clinical deterioration due to gastrointestinal bleeding was developed by the doctoral student in consultation with two simulation experts. It was designed to resemble a rapid response call and lasted approximately five minutes. The patient (a computerized mannequin-Laerdal 3G) was controlled by use of a computer program operated by the doctoral student. A medical surgical

nurse was present in the simulation. This role was played by the same MICU nurse following a script. Following the Jefferies framework for simulation, the participant was given cues throughout the simulation including a dropping blood pressure, altered mental status, and a large pool of blood. These clinical changes were intended to guide them to call the provider at the end to seek further assistance. The medical surgical nurse role was fulfilled by the same MICU nurse for all the simulations. The medical surgical nurse was an important component of the simulation to fully replicate a RRT call. The nurse provided the participant with information about the patient in the simulation and assisted with tasks such as placing orders or taking vital signs. The provider's role was fulfilled by the doctoral student. Scripts were written for these roles. (See Appendix C) Objectives for the simulation were:

1. Assess and intervene on a patient whose status is deteriorating.
2. Collect information from the patient, medical surgical nurse, and patient's chart.
3. Contact the patient's provider to ask for assistance.

Day of simulation. The simulation was offered on two different days. Upon arrival to the simulation center, the participant was asked to complete a demographic survey (Figure 2) inquiring about age, gender, years as a nurse, years as a critical care nurse, certification status, how long they have been a RRT nurse, and if they were currently using a communication tool while in their role as an RTT nurse. Each participant was oriented to the setup of the room, how the computer worked to obtain vital signs, and where to find necessary equipment. The participant was also given the rapid response team bag with pressure bag with tubing, a stethoscope, and the institution's RRT reference manual. The participant then completed the first simulation.

Debrief and education. After completion of the first HFS, the participant underwent debriefing in a private conference room at the simulation center. Debriefing included discussion with the participants about how they felt the scenario went, what they learned, and how to apply the experience to their role as an RRT nurse. Education by the doctoral student was then provided about the communication tool, I-PASS-the-BATON developed by AHRQ (n.d.) (Figure 3). This acronym stands for: I for introduction of the RRT nurse; P for patient identifiers such as age and location; A is for assessment which includes chief complaint and vital signs; S is for situation such as what is currently going on with the patient; S is for safety which includes abnormal lab values; B is for background such as current medications or comorbidities; A is for action pertaining to what the RRT nurse has done so far; T is for timing where the RRT informs how urgent the situation is; O is for ownership such as who should do what to assist with the deteriorating patient; N is for next including should be done next such as labs or transfer to an ICU (AHRQ, n.d). Each letter of the tool was taught, an example was given for each letter, and the tool was distributed to each participant in the form of a laminated card. A video developed by AHRQ was then shown as an example of how to use the communication tool from start to finish properly (Figure 4). Participant's questions were answered. The participant then repeated the same simulation while being encouraged to use the I-PASS-the-BATON tool. After completion of the second simulation, the doctoral student debriefed each participant and inquired about their thoughts and feelings through four open ended questions. Finally, the participant completed the doctoral student developed survey (Figure 5) that assessed their intent to use the communication tool in their RRT role. The entire simulation-scenario 1, education on the tool, scenario 2, and debriefing- took approximately 30 minutes. The doctoral student provided all education and

debriefing and attended a simulation facilitator class to increase her skill set in simulation facilitation.

Measures

Demographic information was collected by a doctoral student developed survey, that included age, gender, years as a nurse, years as a critical care nurse, certification status, and how long they have been a RRT nurse, if they were currently using a specific communication tool in their RRT nurse role.

After participation and debriefing of the second simulation, a doctoral student developed survey was administered to the participant asking if they intended to use the structured communication tool, I-PASS-the-BATON during future RRT calls along with the effectiveness and teaching of the communication tool, simulation, and education. Face validity was established for the doctoral student developed survey by the simulation director, academic advisor, and an RRT nurse who completed the simulation for testing. Three experts completed a six question survey inquiring about the wording, rating scale, and topics questioned on the doctoral developed survey. No changes were made to the simulation or the student developed survey after expert review.

Data Analyses Plan

All data was analyzed using IBM SPSS Statistics for Mac version 24.0 (IBM Corp, 2016). Demographic information was described using descriptive statistics. Frequencies and percentages were reported on the responses to the doctoral student developed survey taken after completion of the simulation. Due to a small sample size and little variation of answers, a relationship between demographic variables and outcomes of the survey was unable to be

completed. Qualitative data, including written comments by participants, collected from the doctoral student developed survey is stated in results.

Protection of Human Subjects

Approval for this study was obtained by the IRB at the doctoral student's university and at the clinical site. A consent was not required and this study was deemed IRB exempt by both panels (Appendix B). Due to a small sample size, demographic data was collected in provided ranges to protect confidentiality of the participants.

Results

Twelve RRT nurses out of a possible 25 participated in the study. All twelve RRT nurses completed the demographic survey, orientation to the simulation center, two simulation scenarios, two debriefing sessions, education about the structured communication tool, I-PASS-the-BATON, and completion of the doctoral student developed survey. Each simulation was completed in the same acute care hospital room in the simulation center. The average time length until the participant called the provider was four minutes and seven seconds for the first simulation and three minutes and thirty-nine seconds for the second simulation. The doctoral student was the provider on the phone for all simulations. The bedside nurse during the simulation was the same MICU nurse for each simulation. Debriefing, education, and completion of surveys were completed in a private conference room immediately following the simulation. The participants completed the doctoral student developed survey after the doctoral student left the room to support confidentiality and encourage full report of quantitative and qualitative responses.

The majority of participants were female within the age range of 25-34 years. Fifty percent of the participants had two to five years of experience as a licensed nurse and two to five

years as a critical care nurse. A majority of the participants (58.3 %) held the national certification of Critical Care Registered Nurse (CCRN). Twenty-five percent of the participants had less than 6 months of experience as an RRT nurse, 33.3% had two-four years and 33.3% had greater than seven years of experience. All 12 participants stated that they currently use SBAR as a communication tool. See Table 2 for complete demographic data.

The doctoral student developed survey showed that 91.7% intended to use I-PASS-the-BATON in future RRT calls. The majority of participants (83.3%) agreed that this communication tool was easy to use. All the participants thought the instruction through HFS was effective and would like to use HFS in the future for education of RRT nurses. See Table 3 for complete results of the doctoral student developed survey responses.

No association was found between demographic data and participants' intent to use the structured communication tool using exact chi-square tests. The intent to use structured communication tool survey consisted of six questions that were agree or disagree. Out of the twelve participants, two answers were left blank, and a total of five disagrees were recorded. Of those five disagree responses four came from the same participant. This participant was not distinguished, demographically, in any particular way from the other respondents in the sample.

Qualitative data collected from comments acquired by the doctoral student developed survey I-PASS-the-BATON included (Table 4),

"I like it as a more in depth guide for reporting; helpful in that it gives me more important points to cover that may be missed in escalating situations"

and "I like this mnemonic better because it provides the receiving caller concise information regarding the scenario without causing confusion by a disorganized report." Participants also commented about the simulation experience,

"Great job! I believe the simulation was highly like RRT calls we receive. Great idea to use for our new RRT nurses" and "It is difficult to completely simulate all aspects of a real simulation due to the inability to create smells, cool, diaphoretic etc.. I do believe that it is always beneficial to practice and review with what can be simulated. I truly enjoy these exercises. Thank you for this opportunity!"

Discussion

Participation in a HFS by 12 nurses working on RRTs in a rural, community hospital indicated that the majority of them intended to use a structured communication tool. The tool, I-PASS-the-BATON, was developed by AHRQ and although empirical evidence of effect is lacking over 90% of study participants reported they would use this tool in future interactions with providers. This study was unique due to the fact that no studies were found that reported on the use of structured communication tools in HFS as means of specifically educating RRT nurses.

Results and Procedures

The results and procedures align with the studies completed by McCrory et al. (2012) and Delac et al. (2013). Both studies involved two simulations with education and debriefing between each simulation and reported positive results similar to this study. McCrory et al. (2012) studied the use of a handoff tool by pediatric interns. The researchers developed two scenarios for simulation in which the intern attended one simulation before education of the handoff tool and then one after. The interns performed more components of the handoff tool in a timelier manner and included more components of a handoff tool ($P< 0.001$) after the second simulation. Although, this study did not focus on the participants accuracy of completing I-PASS-the-BATON, the education method used between the two studies were similar. This study and

McCrory et al. (2012) performed an educational intervention and debriefing in between simulations. The study goals were very similar between the projects. They both taught a new structured communication tool. However, McCrory et al. (2012) focused on the actual use of the tool instead of this study which focused on the intent to use the structured communication tool. Both studies indicated a positive result towards their study goal.

Delac et al. (2013) and this study also had similar procedures. Delac et al.(2013) studied medical surgical nurses who responded to codes within a hospital setting. Simulations were brought to various units in which two different scenarios were presented with debriefing in between. A pre-and post-survey given to the participants reported a 20.4% increase in confidence in the way the nurses felt about their hand off communication after the second simulation. This study also completed two simulations with debriefing in between. Although, pre intervention data was not collected in this study both studies completed two simulations with debriefing and had positive results pertaining to their study goals.

Debriefing has been identified as an essential component to learning by the International Nursing Association for Clinical Simulation and Learning (INACSL, 2016) in which understanding and what was completed in the simulation is transferred to the professional role. Each participant in this study was debriefed after each simulation. Debriefing was also completed in all but one (Beebe et al., 2012) of the studies presented in the literature review (McCrory et al., 2012; Delac et al.,2013; Kaplan et al.,2011; Hirokawa et al., 2012; Su et al., 2014; Clark et al., 2010) indicating that the study designs have attempted to follow the INACSL guidelines. In this study, the procedure allowed each participant the time to reflect about the simulations could possibly explain why the majority of participants agreed that they intended to use I-PASS-the-BATON during future RRT calls.

Although not part of the original procedures, the doctoral student contacted directors of RRT programs of three other major health systems to assess and compare the use of simulation among RRT teams. Health system 1 reported that they use simulation on a quarterly basis to maintain competencies and is also a part of their orientation process into the RRT role. Health system 2 reported that they used simulation to practice Advanced Cardiac Life Support (ACLS), Basic Life Support (BLS), and often partake in simulations with medical surgical nurses to educate on proper activation of the RRT. Simulation focusing on the RRT nurse with education about interventions is not regularly conducted. Health system 3 reported the use of simulations in every other year training on team dynamics in high stakes RRT events. All three health systems used SBAR as the structured communication tool to communicate with providers. The third health system uses SBAR when they first arrive in a patients room and an institution-specific structured communication tool before leaving the patient's room as a debriefing mechanism.

Simulation Design

The simulation scenario in this study was similar to simulations included in the reported studies presented in the literature review (McCrory et al., 2012; Delac et al.,2013; Kaplan et al.,2011; Hirokawa et al., 2012; Su et al.,2014;Beebe et al., 2012; Clark et al., 2010) which focused on a patient whose status was deteriorating. This study's simulation scenario also included a patient whose status deteriorated to closely resemble an RRT call. Comments obtained through the doctoral student developed survey revealed that participants felt like the simulation scenario presented resembled frequent RRT calls at the practice site. The close resemblance of a RRT call gave each participant the ability to understand what it would be like to use a structured communication tool in an actual RRT call that might happen while working as

a RRT nurse in the hospital. This could have allowed the participants to fully understand their feelings and honestly answer their intent to use I-PASS-the-BATON question.

Possible reasons why the participants' reported that the simulation was effective included theory based design of the HFS and debriefing, the real life set up of the simulation, and the consistent script based role of the provider and medical surgical nurse. The design of the simulation adhered to the Jefferies framework for simulation which could be one reason why all the participants thought the simulation was effective and agreed that HFS should be used for future education of RRT nurses (2005). Objectives were stated before beginning each simulation along with an extensive orientation of the simulation room including the equipment needed to take care of the patient. The simulation was high fidelity in which the mannequin spoke, had breath sounds, and demonstrated bleeding through the use of imitation blood. There were cues such as a drop in the patient's blood pressure, and altered mental status of the patient to trigger the RRT nurse to need to call the provider or provide interventions. The success of the simulation aspect of the educational intervention could explain why the majority of participants answered that they intended to use I-PASS-the-BATON on future RRT calls.

Structured Communication Tool

The structured communication tool, I-PASS-the-BATON, developed by AHRQ as part of the "teamSTEPPS®" curriculum was taught as the structured communication tool not SBAR. This was due to the site specific conditions that involved a very negative reaction to SBAR by RRT members. Thus, the doctoral student chose I-PASS-the-BATON as an alternate tool. Aspects from the "teamSTEPPS®" curriculum was specifically mentioned and used in the studies completed by Beebe et al., (2012) & Kaplan et al., (2011). The use of I-PASS-the-BATON as an

alternate tool to SBAR decreased potential bias in this study that could have affected study results.

Limitations

The major strengths of this study included the study of practicing RRT nurses, design and execution of the HFS based on a theoretical framework, and the study question that aimed to address the gap in evidence of the impact of HFS on RRT nurses communication skills. The methods of this project were carried out in a consistent manner including scripts for the simulation insuring that each participant had the same experience to decrease bias. Another strength was that the HFS was completed in consultation with two simulation experts to ensure that the design of the HFS adhered to Jefferies Framework for Simulation.

The limitations of this study included the single site and small sample size by convenience sampling with no control or randomization. The small sample size could be explained by the RRT nurses participating in the study on their own time and recruitment strategies. Although incentives were offered it was not substantial. The pool of available RRT nurses was only 25 so the participation rate was 48%. There was also a change in leadership at the practice site that took place after completing this study affecting future study implications.

Nursing Practice Implications

Findings from this study promoted the use of an education intervention using HFS to teach the proper use of a structured communication tool during high stress situations in the hospital setting such as RRT calls. This could also be used in other situations such as handoff between fellow nurses or other members of a healthcare team to potentially improve communication skills ultimately decreasing errors caused by poor communication. This method

of learning by nurses through HFS could also be replicated to teach other aspects of nursing care that is not safe to practice on live humans.

Products of the Scholarly Practice Project

This project will be used to apply for a doctorate of nursing practice by the doctoral student. This program will be petitioned to be included in the orientation process for new RRT nurses at the doctoral student's practice site. In addition, the doctoral student has begun to build regional relationships with other RRT in the practice area. The abstract was accepted by the Virginia Council of Nurse Practitioners annual conference for a poster presentation. The manuscript resulting from this project will be submitted to the peer reviewed journal, *Simulation in Healthcare; Journal of the Society for Simulation in Healthcare,* for publication (Appendix D).

Conclusion

The results of this study showed that RRT nurses intended to use a structured communication tool in future RRT calls after completion of an educational intervention consisting of HFS. Though the number of RRT nurses who participated was small, almost 100% reported that they intended to use I-PASS-the-BATON on future RRT calls. These findings could be used to design future studies and to design orientation and education of RRT nurses.

A systematic literature review of 45 articles conducted during 2000-2016 conducted by Jeppesen et al. (2017) about nursing education identified that simulation is an effective means of education for transferring practical skills easily in the healthcare setting. A structured communication tool such as, SBAR or I-PASS-the-BATON has been promoted for use by the Institute for Healthcare Improvement and AHRQ to prevent communication errors. Three southwest regional major healthcare system currently use simulation as means to maintain proper

skills and communication for their RRT nurses. Three major health systems promote the use of a structured communication tool during communication with providers. Although this study was completed with a small sample size in a community hospital, 91% of participants agreed that they intended to use the structured communication tool I-PASS-the-BATON during future RRT calls to the provider. These results will be presented to the RRT director with high recommendations to implement this as part of the RRT orientation and mandatory competency requirement. The implementation of a structured communication tool during RRT calls could prevent communication errors between a RRT nurse and provider and upon further research could potentially improve the function of the RRT nurse during an RRT call at a rural community hospital.

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Table 1

Review of Literature

Reference & Design	Subjects & Setting/ Period of Data Collection	Outcomes	Limitations	Measures
Delac, Blazier, Daniel, & N-Wilfong, 2013 Design: prospective, pre-interventional and post interventional study	Subjects & Setting: Telemetry and medical-surgical nurses at Allegheny General Hospital Period of Data Collection: February 2011- November 2011	65% improvement in the participant's response to perform CPR. 67% improvement in defibrillation. Improvement in confidence and improvement in hand-off communication to the rapid response team from 60.2% to 80.6%. **Communication improved after simulation.**	No inferential statistics No comparison group	Investigator developed survey
Hirokawa, Daub, Lovell, Smith, Davis & Beck, 2012 Design: prospective, pre-interventional and post interventional study	Subjects & Setting: Junior nursing students in bachelor of science program. University simulation center. Period of Data Collection: Not stated	A significant positive relationship between team performance and the amount of utterances and behaviors that were about implementation actions. The highest performing team discussed	Small sample size (12) No comparison group	ADPIE communication Index (ACI) Performance Criteria Checklist (PCC)

Reference & Design	Subjects & Setting/ Period of Data Collection	Outcomes	Limitations	Measures
		assessment of the patient the most. **The more discussion about actions to save the patient lead to the best outcomes for the patient.**		
McCrory, Aboumatar, Custer, Yang & Hunt, 2012 Study Design: Quasi-experimental	Subjects: Pediatric Interns (part of the pediatric RRT) (n=27) Setting: Johns Hopkins University Hospital Simulation Center Period of Data Collection: June 2008	Total score of hand- offs improved significantly after simulation. More components of ABC-SBAR were included post intervention. The length of time to complete ABC-SBAR decreased after intervention. **Communication was more efficient and the correct level of detail was given concerning the patient's status after simulation.**	Variation in assessing the tasks completed tool by two different graders. ABC-SBAR tested on a simulated patient, not real patient. Completed in simulation center, not in a hospital room. Validity and reliability of evaluation was not tested.	Investigator developed tool
Kaplan, Holmes, Mott & Atallah, 2011	Subjects: Senior nursing students & emergency	Confidence levels increased among BSN	Two different student populations.	Investigator developed survey

Reference & Design	Subjects & Setting/ Period of Data Collection	Outcomes	Limitations	Measures
Study Design: prospective, pre-interventional and post interventional study	nurse practitioner students Setting: Simulation center of a University affiliated nursing school. Period of Data Collection: Not Stated	students and ENP students. Debriefing revealed increased communication among both sets of students and strong teamwork. **Practicing roles in a safe environment (simulation) led to better communication among the team.**	Varying levels of education of the sample. Validity and reliability of evaluation was not tested. Weak statistical data provided. No comparison group	
Clark, Fisher, Arafeh, & Druzin, 2010 Study Design: prospective, pre-interventional and post interventional study	Subjects: L&D staff at University of Utah Hospital Setting: L&D room Period of Data Collection: Not Stated	"Many staff stating that they see an improvement in team functioning and communication as a result of the training" **Practicing the patient scenario improved overall communication the next time that type of patient was encountered by the team.**	Extensive literature review and methods provided, but no statistical data. Did not state how they are measuring improved communication. No comparison group Inferential statistics not completed	Investigator developed survey
Su, Spaeder, Jones, Sinha, Nath, Jain, et. al, 2014	Subjects: ECMO Team Setting: Cardiac ICU	Median deployment time decreased from 51 minutes to 40 minutes	Small sample size	Investigator developed tool

Reference & Design	Subjects & Setting/ Period of Data Collection	Outcomes	Limitations	Measures
Study Design: Quasi-experimental, Addressing gaps in literature and being evidence based are the major strengths of this study. retrospective & prospective	Period of Data Collection: Before intervention: February 2009 to March 2010 After intervention: April 2010 to March 2013	after going through simulation ($p = 0.018$). **Communication improved after simulation as evidenced by a faster deployment time.**	Patient variability will affect time such as anatomy or complications in process. No guarantee that all participants underwent simulation because it was retrospective and addition of new staff after simulation.	
Beebe, Bawel-Brinkley, & O'Leary-Kelley, 2012 Study Design: Observation	Subjects: Healthcare workers involved in the RRT when they responded to a call for a deteriorating patient within the hospital. Setting: 574 bed teaching medical center in the San Francisco Bay area Period of Data Collection: Fall 2009	Effective communication was observed by the researcher and team members; however, areas of improvement were discussed such as role confusion, not using the shared mental model, and the bedside nurse not including themselves as part of the team. Did not use all the aspects of teamSTEPPS®. **There are areas where communication needs to be improved after observing RRTs events.**	The researcher being present who have shewed the performance by the team. Small sample size Unknown if any of the members received prior teamwork training. No comparison group No inferential statistics	Team Performance Observation Tool (TPOT) Team Assessment Questionnaire (TAQ)

Table 2

Characteristics of Rapid Response Team Nurses (N = 12)

	n	%
Age (years)		
25-34	8	66.7
35-44	1	8.3
45-54	3	25.0
Gender		
Female	10	83.3
Male	2	16.7
Years as a critical care nurse		
2-5	6	50.0
6-10	1	8.3
11-15	2	16.7
16-20	2	16.7
>20	1	8.3
Certified RN		
Yes	7	58.3
No	5	41.7
Time as a MET nurse[a]		
<6months	3	25.0
6 months – 1 year	1	8.3
2-4 years	4	33.3
>7 years	4	33.3

Note. MET= Medical emergency team.

[a] Time as a MET nurse does not add up to 100 percent due to rounding.

Table 3

Results of Intention to Use Structured Communication Tool (N = 12)

	n	%
Personal instruction effective		
Agree	11	91.7
Disagree	1	8.3
High fidelity simulation effective		
Agree	12	100
I-PASS-the- BATON easy to use		
Agree	10	83.3
Disagree	2	16.7
I-PASS-the-BATON effective		
Agree	9	75.0
Disagree	1	8.3
Missing	2	16.7
High fidelity simulation for future education of RRT nurses		
Agree	12	100
Intention to use I-PASS-the-BATON		
Agree	11	91.7
Disagree	1	8.3

Table 4

Comments from Doctoral Student Developed Survey

Positive
"I like this mnemonic better because it provides the receiving caller concise information regarding the scenario without causing confusion by a disorganized report."
"I think being able to become more familiar with the tool will allow me to use it more effectively. Especially with differentiating between provider's role moving forward and MET's responsibilities after the initial MET call."
"It is difficult to completely simulate all aspects of a real simulation due to the inability to create smells, cool, diaphoretic etc.. I do believe that it is always beneficial to practice and review with what can be simulated. I truly enjoy these exercises. Thank you for this opportunity!"
"I think with some practice, this would be a great tool to use when relaying information to physicians during RRT calls."
"I like it as a more in depth guide for reporting; helpful in that it gives me more important points to cover that may be missed in escalating situations."
"Great job! I believe the simulation was highly like MET calls we receive. Great idea to use for our new MET nurses."
Negative
"SBAR has fewer letters & is easier to remember- especially in a critical situation. I don't know that our providers would be very patient with the extra time it would take to go through a longer communication tool. Perhaps I just need to learn it better."
"I think that "I PASS the BATON" will be easy to use the more I use it, but today it was a little uncomfortable."
"The only reason I disagree is because I have not done the longer report like that, however I will use this again on my next MET call. It definitely makes you think about your call to the MD. I like how, "Timing" is on there and level of urgency is really important."

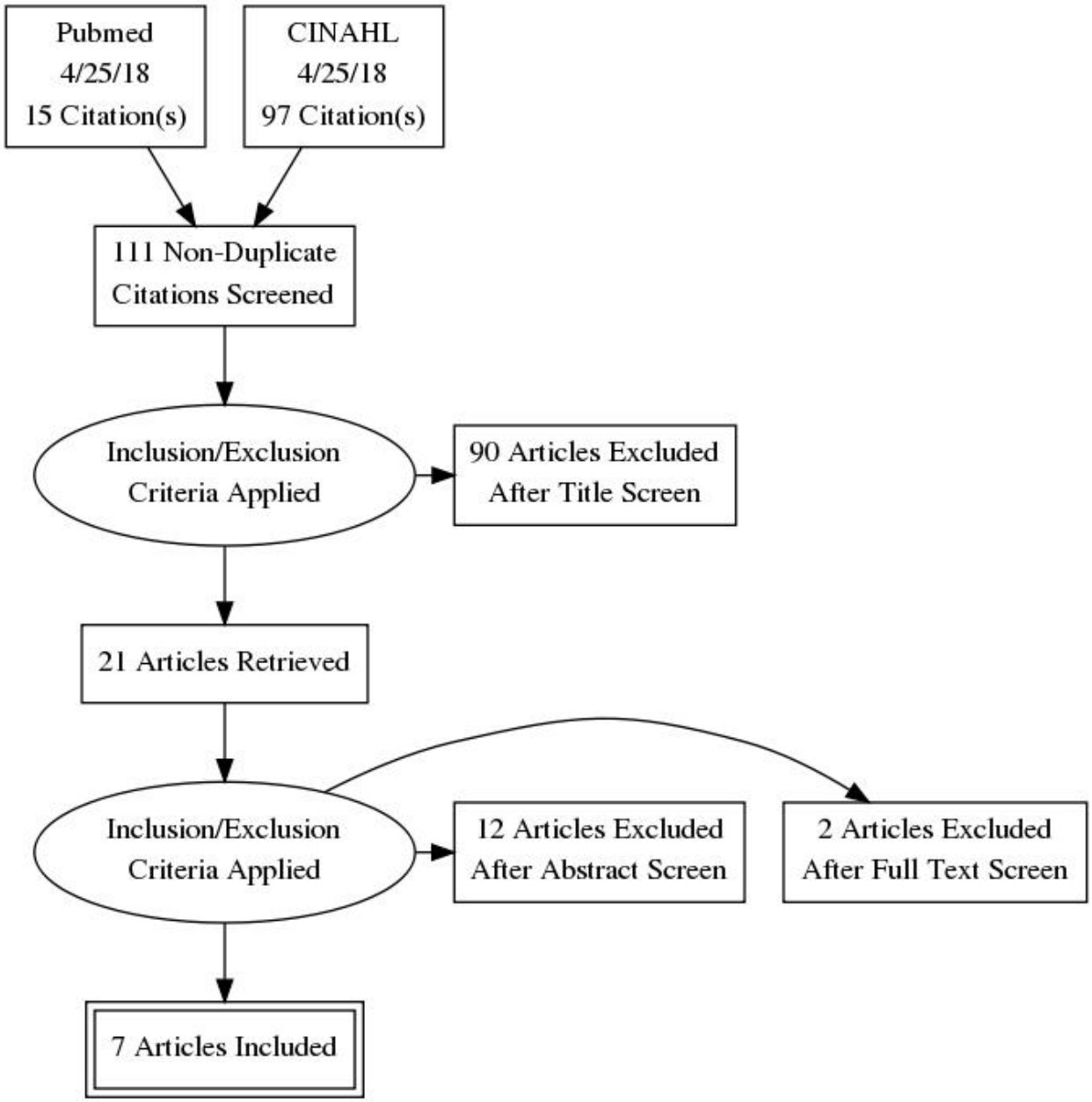

Figure 1. PRISMA flow diagram of selection of articles.

Demographic Information

Please do not put your name on this survey.

Please circle your answer to the following questions:

What is your age?

18-24 years old 25-34 years old 35- 44 years old 45-54 years old >55 years old

What is your gender? Male Female Other

How long have you been a licensed nurse?

2-5 years 6-10 years 11-15 years 16-20 years >20years

How many years of critical care experience do you have?

2-5 years 6-10 years 11-15 years 16-20 years >20years

How many years have you been a nurse in the Medical Intensive Care Unit?

<2 years 2-5 years 6-10 years 11-15 years 16-20 years >20years

Are you certified? YES or NO

If YES, what certification do you have?

CCRN CEN CMSRN PCCN OTHER

How long have you been a part of the Medical Emergency Team (MET)?

<6 months 6 months – 1 year 2-4 years 5-7 years > 7years

Have you previously participated in simulation for education either as a nursing student or practicing nurse? YES or NO

Do you currently use a communication tool while in your role as a MET nurse? YES or NO

If you do use a communication tool what do you use?

SBAR AIDET

I PASS the BATON OTHER

Thank you for taking the time to be a part of my study.

Figure 2. Demographic collection tool.

"I PASS THE BATON"		
I	Introduction	Introduce yourself and your role/job (include patient).
P	Patient	Name, identifiers, age, sex, location.
A	Assessment	Present chief complaint, vital signs, symptoms, and diagnosis.
S	Situation	Current status/circumstances, including code status, level of (un)certainty, recent changes, and response to treatment.
S	Safety	Critical lab values/reports, socioeconomic factors, allergies, and alerts (falls, isolation, etc.).
THE		
B	Background	Comorbidities, previous episodes, current medications, and family history.
A	Actions	Explain what actions were taken or are required. Provide rationale.
T	Timing	Level of urgency and explicit timing and prioritization of actions.
O	Ownership	Identify who is responsible (person/team), including patient/family members.
N	Next	What will happen next? Anticipated changes? What is the plan? Are there contingency plans?

Figure 3. AHRQ "I PASS the BATON" communication tool. Agency for Healthcare Research and Quality. (n.d.) *TeamSTEPPS rapid response systems module.* Retrieved June 7, 2018, from /teamstepps/rrs/instructor_slides/rrsinstructmod.htm

I-PASS-the-BATON

BY: AHRQ

"I PASS THE BATON"		
I	Introduction	Introduce yourself and your role/job (include patient).
P	Patient	Name, identifiers, age, sex, location.
A	Assessment	Present chief complaint, vital signs, symptoms, and diagnosis.
S	Situation	Current status/circumstances, including code status, level of (un)certainty, recent changes, and response to treatment.
S	Safety	Critical lab values/reports, socioeconomic factors, allergies, and alerts (falls, isolation, etc.).
THE		
B	Background	Comorbidities, previous episodes, current medications, and family history.
A	Actions	Explain what actions were taken or are required. Provide rationale.
T	Timing	Level of urgency and explicit timing and prioritization of actions.
O	Ownership	Identify who is responsible (person/team), including patient/family members.
N	Next	What will happen next? Anticipated changes? What is the plan? Are there contingency plans?

(AHRQ)

Example

(AHRQ)

References

Agency for Healthcare Research and Quality, (2017) *Emergency Department: I PASS the BATON.* Retreived from: http://www.ahrq.gov/teamstepps/instructor/videos/ts_passTheBaton/passTheBaton-400-300.html

Figure 4. PowerPoint Education

Intention to Use Structured Communication Tool

To be completed after both simulations

	Disagree	Agree
Did you find education of, "I PASS the BATON" by personal instruction to be effective?	☐	☐
Do you think the high-fidelity simulation was effective?	☐	☐
Did you find "I PASS the BATON" easy to use?	☐	☐
Did you find "I PASS the BATON" effective?	☐	☐
Would you like to see high fidelity simulation used more frequently as means to educate RRT nurses?	☐	☐
Do you intend to use "I PASS the BATON" when calling or reporting to providers during RRT calls?	☐	☐

Comments:

Figure 5. Doctoral student developed survey.

Appendix A. Approval from Human Resources

From: **Lyn Rose Calderoni** Lynrose.Calderoni@Centrahealth.com
Subject: Fw: Follow Up
Date: June 11, 2018 at 3:04 AM
To: lynrosec@gmail.com

From: Karen Ackerman
Sent: Thursday, June 7, 2018 1:40 PM
To: Lyn Rose Calderoni
Subject: Follow Up

Hi there, Lyn Rose!
Thanks so much for your voicemail earlier regarding your research. Please let this email serve as confirmation and approval of your request to involve MET team staff in your project.

Best of luck as you continue to pursue your advanced degree! We're lucky to have you here!

Best,

Karen T. Ackerman, MS, PHR, SHRM-CP
Vice President, Human Resources
Centra Human Resources
(O)434.200.5342
(M)434.401.9939

Appendix B. IRB exempt

Centra Health IRB Appendix H
Lynchburg, VA

RECEIVED 7-13-18

CENTRA HEALTH Institutional Review Board
EXEMPT RESEARCH CHECKLIST
Version 3, 21APR2015

Centra IRB #: CHIRB0428e **IRB of Record** _____ **Date:** 7-13-18

Facility: Lynchburg General Hosptial

EXEMPT
Date: 7-23-18

Principal Investigator: Lyn Rose Calderoni MSN, AGACNP-BC, CCRN

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Title of Research Project/Study Title: The Use of High Fidelity Simulation to Improve Communication Skills among Rapid Response Team Nurses

Attach documents related to the study.

Checklist Statements	True	Not True
Category 1 – For Educational Settings		
1. The research will only be conducted in established or commonly-accepted educational settings including but not limited to schools and colleges. (May include other sites where educational activities regularly occur.)		
2. The research will involve only normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.		
3. The research will not involve individuals as participants who are known to be prisoners.		
4. The research is not subject to FDA regulations.		
Category 2 – For Educational Tests, Surveys, Interviews, Public Behavior Observation:		
5. The research will involve only the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.	X	
Address statement 6 only if the research will involve children as participants. If children will NOT participate, check N/A and continue with statement 7. 6. The procedures will be limited to the use of educational tests (cognitive, diagnostic, aptitude, achievement) or observation of public behavior where the investigator will NOT participate in the activities being observed.		
7. The information obtained from educational tests, survey procedures, interview procedures or observation of public behavior will be recorded in such a manner that human subjects CANNOT be identified, directly or through identifiers linked to the subjects. ***"True" to either statement 7 or 8 will qualify for exemption provided that statements 9 and 10 are true.***	X	
8. Any disclosure of the human subjects' responses outside the research could NOT reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.	X	
9. The research will not involve individuals as participants who are known to be prisoners.	X	
10. The research is not subject to FDA regulations.	X	
Category 3 – For Educational Tests, Surveys, Interviews, Public Behavior		

Observation of Public Officials:		
11. The research will involve only the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior AND the human subjects are elected or appointed public officials or candidates for public office. (Applies to senior officials such as mayor or school superintendent rather than a police officer or teacher.) ***"True" to either statement 11 or 12 will qualify for exemption provided that statements 13 and 14 are true.***		
12. The research will involve only the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior AND federal statute(s) require without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.		
13. The research will not involve individuals as participants who are known to be prisoners.		
14. The research is not subject to FDA regulations.		
Category 4 – For Existing Data, Documents and Specimens:		
15. The research will involve only the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens. ("Existing" means existing before the research is proposed to the IRB to determine whether the research is exempt. All materials to be reviewed currently exist at the time of this exemption request.)		
16. The sources of the existing data, documents, records or specimens are publicly available **OR** the information will be recorded by the investigator in such a manner that participants cannot be readily identified either directly or through identifiers (such as a code) linked to them.		
17. The research will not involve individuals as participants who are known to be prisoners.		
18. The research is not subject to FDA regulations.		
Category 5 – For Public Benefit or Service Programs (Federal):		
19. The project is a research or demonstration project conducted by or subject to the approval of a (federal) Department or Agency head and which is designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those public benefit or service programs.		
20. The research will not involve individuals as participants who are known to be prisoners.		
21. The research is not subject to FDA regulations.		
22. The program under study delivers a public benefit (e.g., financial or medical benefits as provided under the Social Security Act) or service (e.g., social, supportive, or nutrition services as provided under the Older Americans Act).		
23. The research or demonstration project will be conducted pursuant to specific federal statutory authority.		
24. There is no statutory requirement that the project be reviewed by an IRB.		
25. The project does not involve significant physical invasions or intrusions upon the privacy of participants.		
26. The exemption has authorization or concurrence by the funding agency.		
Category 6 – For Taste and Food Quality and Consumer Acceptance Studies:		
27. The research involved only a taste and food quality evaluations or a food consumer acceptance study in which (i) wholesome foods without additives will be consumed **OR** (ii) food will be consumed that contains a food ingredient, agricultural chemical or environmental contaminant that is at or below the level found to be safe by the Food and Drug Administration or is approved by the Environmental Protection Agency or the Food Safety and Inspection Service of		

the U.S. Department of Agriculture.		
28. The research will not involve individuals as participants who are known to be prisoners.		
Emergency Use of an Unapproved Test Article (i.e., a drug, device or biologic that is not FDA-Approved)		
The activity involves emergency use of an investigational drug, device or biologic. Such an activity is not exempt from IRB review. However, this emergency use may occur prior to IRB review and approval (see Category A and B in the Emergency Use Policy for details.) Note that such an emergency use must be reported to the IRB within five business days.		
The activity does not meet with DHHS definition of "research."		
Criteria that must be met for the research to be determined to be consistent with IRB ethical standards		
The research holds out no more than minimal risk to subjects.	X	
Selection of subjects is equitable.	X	
If there is recording of identifiable information, there are adequate provisions to maintain the confidentiality of the data.	X	
If there are interactions with subjects: There will be a consent process (and maybe some type of documentation) that will disclose such information as: • That the activities involve research. • The procedures to be performed. • That participation is voluntary. • Name and contact information for the investigator.	X	
There are adequate provisions to maintain the privacy interests of subjects.	X	

Signature of Principal Investigator: __Lyn Rose Calderoni, MSN, AGACNP-BC, CCRN_____

Typing my name on the line above constitutes an electronic signature.

Printed Name __Lyn Rose Calderoni, MSN, AGACNP-BC, CCRN_____

Date __7/13/18_____

FOR THE IRB REVIEWER ONLY:

Is the activity exempt? YES [✓] NO [ ]

Does the research meet the standards of ethical conduct? YES [✓] NO [ ]

Which exemption category or categories apply to the activity? Educational Cat. 2

Approved by IRB (date): 7/23/18

Signature of IRB Reviewer: _____

Typing my name on the line above constitutes an electronic signature.

Printed Name Donna Washburn MSN, RN, CNS, ACNS-BC, AOCNS

Date 7/23/18

Appendix C. Simulation Scripts

Script for Bedside Nurse

Background: Jane Smith is a 67 female with a PMH of Afib & HTN admitted this afternoon with weakness and fatigue. She was admitted for observation due to symptoms and mild anemia with no bleeding source evident. The family member recently called you because they were concerned that the patient was confused and lethargic. You performed an assessment and also came to the same conclusion, so you called the MET nurse. The nightshift MET nurse has just arrived in the room.

The patient has been sleepy, but acting fine until a few minutes ago when the family member rang the call bell saying the patient was confused. The family member is currently nowhere to be found.

The floor is short staffed tonight so you are VERY busy and feeling overwhelmed. You act like you don't have time to stay in the room very long. After you tell the MET nurse what you know you leave halfway through answering their questions and performing their assessment. Then come back in 30 seconds later.

Vital Signs: Have been normal all evening. The last set revealed a lower blood pressure and higher heartrate than what she had been running.

Medications: You gave her all her medications this evening, which wasn't very much. A blood pressure medication and her blood thinner for her A-fib.

Assessment: Her assessment was WNL except for her confusion and appearing to be more out of it than what she previously had been.

Encourage the MET nurse to do their own assessment if they don't start doing one and frequent monitoring of vital signs.

The patient's blood pressure will continue to drop as the simulation progresses and her heartrate will increase. A large bloody bowel movement is under the patient.

If the MET nurse wants to start to clean the patient tell them not to worry about it, that they have more important things to do and you will do it. Suggest calling the provider. (wash cloths will be available if it goes in this direction)

Anticipate hanging a fluid bolus. (All materials will be available and the patient will have IVs)

If they ask you to call the provider, act clueless and push it back to the MET nurse. Show the MET nurse where the phone and number is if they don't remember.

When the MET nurse starts to dial the phone to call the provider, walk out of the room. (remember you are having a really busy day.)

After the phone call is finished, the simulation is over.
If the MET nurse asks you something that you do not know the answer to respond with, “I don’t have that information available”

Jane Smith Script

Birthdate: 05/13/1951

Can you tell me what your name is? Jane

Can you tell me where you are? I’m at home, right?

Can you tell me what year it is? 1998?

Can you tell me who the president is? What president?

How are you feeling? I am very tired and don’t feel right. I felt ok earlier just weak. Answer questions oddly because you are confused.

Are you in pain or Does anything hurt? Yes, my belly hurts and is cramping.

Can you give me a number for your pain? 4

Does it hurt when I press on your abdomen? I don’t know what you are talking about.

If RRT nurse does not find bloody stool during assessment:

Cue: “I feel like there is something wet under me”

Assessment: Answer questions slowly, like you are having difficulty following the conversation. Deny any symptoms, but belly cramping. “I just don’t feel right”

When asked about blood thinner: Once again slow to answer, “I think I take a pill to make my blood thin”

<u>Dr. Good’s Script</u>

First Simulation:
Answer phone call from MET Nurse:

Dr. Good. How can I help you?

Question who the nurse is calling about… What is the patient's name and Birth date? (Jane Smith, 5-13-1951)

After responding with the correct name and birthdate as them to continue on…

Do not interrupt during the first simulation. After the nurse has finished her discussion answer with, "Thank you for calling me about this patient. I am on my way to her room now. See you soon"

Second Simulation:
Answer phone call from MET Nurse:

Dr. Good. How can I help you?

Question who the nurse is calling about… What is the patient's name and Birth date? (Jane Smith, 5-13-1951)

After responding with the correct name and birthdate as them to continue on…

Coach the nurse through I-PASS-the-BATON. Ask to hear about each letter if they go off track. This time interrupt them so they go in order of the acronym.

After the nurse has finished her discussion answer with, "Thank you for calling me about this patient. I am on my way to her room now. See you soon"

Scenario Title: MET Communication Scenario

<u>References:</u>
ACLS Protocol- fluid bolus for low blood pressure
I-PASS-the –BATON AHRQ
January, C.T., Wann, L.S., Alpert, J.S., Calkins, H., Cigarroa, J.E., Cleveland, J.C., … Yancy, C.W. (2014). 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. *Circulation*, 130, 199-267. Retrieved from https://www.ahajournals.org/doi/10.1161/CIR.0000000000000041
Kasper, D.L., Fauci, A.S., Hauser, S.I., Longo, D.L., Jameson, L., Loscalzo, J. (Eds.). (2012). *Harrison's principles of internal medicine* (19th ed.). McGraw- Hill Education

CHA_2DS_2-VASc = 3
Female, 67, HTN – Needs Anticoagulants

<u>Objectives</u>:
1. Assess and intervene on a patient whose status is deteriorating.
2. Gather information from the patient, medical surgical nurse, and patient's chart.

3. Make a phone call to the patient's provider in which the RRT nurse must ask for further assistance.

Manikin:
☐SimMan 3G ☐SimJunior ☐SimMom ☐Nursing Anne
☐SimMan Essential ☐SimBaby ☐SimNewB ☐Megacode Kelly

Patient Data:
Patient Name: Jane Smith
Age:67
Gender: Female
Weight:60 ☒Kg ☐ Lb
Height:Click here to enter text.

Scenario Outline: Jane Smith presents to the ED with weakness. She was admitted to a medical surgical floor for observation due to a slight decline in hemoglobin. The medical surgical nurse was called to the room by a family member who noticed that the patient has become confused and lethargic. The nurse realizes that the patient's behavior has changed since being admitted and calls the MET nurse. Upon arrival of the MET nurse, the patient's blood pressure drops, an assessment identifies a large bloody bowel movement, and the MET nurse calls the provider for further guidance.

Learner Brief: Jane Smith is a 67 female with a PMH of Afib & HTN admitted this afternoon with weakness and fatigue. She was admitted for observation due to symptoms and mild anemia with no bleeding source evident. The family member recently called the nurse because they were concerned that the patient was confused and lethargic. The nurse performed an assessment and also came to the same conclusion, so she called the MET nurse. You are the nightshift MET nurse and have just arrived at the patient's room.

☐Display on patient monitor prior to scenario start.

Equipment Checklist: Peripheral IVs already established. MET bag which includes a stethoscope, reference manual and clipboard with MET reporting sheets. In room for use during simulation: nasal cannula, 1,000ml NS, straight tubing, pressure bag, 10ml NS flushes

Only use one phase
Phase 1: Initial State
Vital Signs: HR 105 EKG Rhythm: Sinus Tach RR 26 Temp. 98.7 BP: 105/60 Pulse Ox: 96%
Lung sounds: Clear Bilaterally
Heart sounds: S1, S2
Bowel sounds: Hyperactive
Other symptoms (pupil size, pulses, secretions, etc): WNL
Pre-Programmed vocal: Click here to enter text.
Trends and/or Handlers: Over 5 minutes: blood pressure to 60/40. Heartrate to 120- sinus tach
Transition time to state: Click here to enter text.

Event: Please list any events (interventions or tasks) that the learner must do to progress to the next phase. Examples: Wash Hands, Introduce Self, Place Foley Catheter, etc
Learner must communicate with Physician via phone. Scenario will end after phone call.

OTHER CONSIDERATIONS

Equipment Needed:

☐ Zoll Defibrillator	☒ Oxygen therapy (please describe): Click here to enter text.	
☐ Adult Crash Cart	☐ Ventilator	☐ BiPap
☐ CPAP	☐ Foley Catheter	☐ Bair Hugger
☐ Isolation Cart	☒ IV Pump	☐ PCA Pump
☐ Epidural Pump	☐ Medications (please describe): Click here to enter text.	

Disposable Supplies:
1,000ml NS
IV Straight tubing
Pressure bag
10ml NS flushes

Appendix D. Manuscript for Publication

Cover Letter

All authors acknowledge their familiarity with the manuscript instructions and agree to the contents of the submitted paper.

There are no conflicts of interest or financial disclosure information to disclose.

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Use of High Fidelity Simulation to Improve Communication among Rapid Response Teams

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Abstract

Introduction: Rapid Response Teams (RRTs) are an important element in a hospital's quality and safety program that have been shown to decrease mortality and cardiac arrests. Communication has been identified by The Joint Commission as the third root cause of sentinel events in hospitals. High fidelity simulation (HFS) is used throughout the nursing arena as a safe means to educate and practice necessary skills. Equipping RRTs with effective communication skills to further enhance their performance will greatly impact patient care. The purpose of this study was to determine if participation in an educational intervention consisting of HFS by RRT nurse promoted the intent to use a structured communication tool when reporting to providers.

Methods: Participants from the RRT consisting of nurses from a Medical Intensive Care Unit at a community hospital participated in two simulations that closely resembled an RRT call which involved a deteriorating patient. Education about the communication tool, I-PASS-the-BATON, from AHRQ's teamSTEPPS® ,was conducted between each simulation. Participants completed a researcher developed survey after the second simulation to assess their intent to use the communication tool.

Results: Twelve Rapid Response Team Nurses participated in the study in which 91.7% had the intention to use I-PASS- the-BATON in future RRT calls.

Conclusions: Participation in HFS that included instruction on how to use a structured communication tool by RRT nurses did effect their intent to use the instrument. More study is needed due to small sample size to determine if this will promote effective communication skills.

Introduction

Rapid Response Teams (RRT) are an important element in the quality and safety movement. RRTs, also known as Medical Emergency Teams (METs), are described as, "When a patient demonstrates signs of imminent clinical deterioration, a team of providers is summoned to the bedside to immediately assess and treat the patient with the goal of preventing intensive care unit transfer, cardiac arrest, or death".[1] The structure of the RRT varies depending on the healthcare system. The team may consist of one Intensive Care Unit (ICU) nurse, a resident, a respiratory therapist, and the bedside nurse. In some systems, RRTs are comprised of only one ICU nurse that works alongside the bedside nurse [2,3] Despite the specific configuration of the RRT, teamwork and especially communication within the RRT and between the RRT and the bedside nurse is crucial.

Communication is an important skill for effective teams and several organizations have developed programs or standards. In 2016, The Joint Commission published statistics about sentinel events identifying communication as the third highest root cause of these events.[4] The AHRQ formed a teamwork program, called "teamSTEPPS®" created specifically for healthcare professionals[5]. One of the main goals of "teamSTEPPS®"is to improve communication and team skills for more optimal outcomes. The use of several structured communication tools, such as SBAR (Situation, Background, Assessment, and Recommendation) and I-PASS-the-BATON are reported in the "teamSTEPPS®" curriculum as means to have effective communication skills with members of a healthcare team.

A meta-analysis of 20 studies indicated that simulation improved learning outcomes in professional nurses compared to traditional education.[6] Lewis, Strachan, and Smith[7] completed a review of 16 articles that involved practicing nurses and midwives who used simulation as means

for education [6]. They specifically reviewed non-technical skills such as teamwork, communication, and decision making during simulation. They concluded that simulation as an educational strategy can be used to improve communication skills.

The use of RRTs in the acute care setting is supported by empiric data and national quality bodies.[1,2] Communication is recognized as a critical skill among RRT members and simulation has been shown as an effective way to educate members of RRTs.[6,8,9] However, few studies were found that reported on the effect of HFS on communication among RRT nurses. Therefore, the purpose of this study was to determine if participation in an educational intervention in HFS format by nurses on a RRT promoted the use of a structured communication tool. Specifically, did participation in an educational intervention consisting of HFS by RRT nurses in a community hospital increase their intent to use a structured communication tool, I-PASS-the-BATON, when reporting to providers?

Methods

Research Design

This study was a quality improvement project that used a descriptive analysis of the effect of participation by RRT nurses in an education intervention using a HFS format that included instruction in the use of the structured communication tool, I- PASS-the-BATON. Post intervention data were collected and a quantitative, descriptive analysis was completed. Although SBAR and I- PASS-the-BATON were both created by AHRQ and there is more evidence in the literature about SBAR, I-PASS-the-BATON was used due to the practice site's negative bias towards SBAR.

Sample

A convenience sample of 25 nurses who worked in the MICU of a community hospital in southwest Virginia and were members of the RRT were asked to participate over a 4-week time period between August to September 2018. Inclusion criteria were: any currently practicing RRT nurse in the MICU at the practice site who had completed the Fundamental Critical Care Support class, with at least two years of critical care experience. Exclusion criteria were: travel nurses and MICU nurses not oriented to the RRT role.

Setting

The setting was a nonprofit, 358 bed level II trauma center, rural, community hospital. In 2017, there was a monthly average of 238 RRT calls. The simulation took place in the hospital's simulation center in the acute care room. Other equipment used in the simulation included a computer controlled mannequin for HFS, IV fluid, IV fluid tubing, vital sign monitoring system, pretend blood, and peripheral IV equipment.

Measures

Demographic information was collected by the researcher developed survey including if the participant was currently using a specific communication tool in their RRT nurse role. After participation and debriefing of the second simulation, a researcher developed survey was administered to the participant asking if they intended to use the structured communication tool, I-PASS-the-BATON during future RRT calls along with the effectiveness and teaching of the communication tool, simulation, and education. Face validity was established for the researcher developed survey.

Procedures

Recruitment. Prior to recruitment of participants, this project was sent for review by the human resources department at the practice site for approval. Once approval was granted, this

project was submitted for review by the Institutional Review Board (IRB) at the doctoral student's university and at the clinical site. After both boards deemed this project IRB exempt, recruitment of subjects was begun. Announcements of the study were placed on a private social media page for the MICU, flyers were posted in the MICU breakroom, and the project was discussed with staff. Points toward the Nursing Engagement Program of the practice site was rewarded for each nurse that participated. The Nursing Engagement Program rewards nurses who participate in activities at the practice site with a differential added to their hourly pay. In addition, an incentive of a gift card to a local coffee shop was given to each participant. The participant attended the study on their day off. Each participant signed up for a specific time slot electronically.

Simulation scenario. A HFS scenario of a medical-surgical patient demonstrating clinical deterioration due to gastrointestinal bleeding was developed by the researcher in consultation with two simulation experts. It was designed to resemble a rapid response call and lasted approximately five minutes. The patient (a computerized mannequin) was controlled by use of a computer program operated by the researcher. A medical surgical nurse was present in the simulation. This role was played by the same MICU nurse following a script. Following the Jefferies framework for simulation, the participant was given cues throughout the simulation including a dropping blood pressure, altered mental status, and a large pool of blood. These clinical changes were intended to guide them to call the provider at the end to seek further assistance. The medical surgical nurse was an important component of the simulation to fully replicate a RRT call. The nurse provided the participant with information about the patient in the simulation and assisted with tasks such as placing orders or taking vital signs. The provider's role was fulfilled by the researcher. Scripts were written for these roles. Objectives for the

simulation were: 1. Assess and intervene on a patient whose status is deteriorating. 2. Collect information from the patient, medical surgical nurse, and patient's chart. 3. Contact the patient's provider to ask for assistance.

Day of simulation. The simulation was offered on two different days. Upon arrival to the simulation center, the participant was asked to complete a demographic survey including inquiring if they were currently using a communication tool while in their role as an RTT nurse. Each participant was oriented to the setup of the room, how the computer worked to obtain vital signs, and where to find necessary equipment. The participant was also given the rapid response team bag with pressure bag with tubing, a stethoscope, and the institution's RRT reference manual. The participant then completed the first simulation.

Debrief and education. After completion of the first HFS, the participant underwent debriefing. Education by the researcher was then provided about the communication tool, I-PASS- the- BATON developed by AHRQ[10] (Figure 1). Each letter of the tool was taught, an example was given for each letter, and the tool was distributed to each participant in the form of a laminated card. A video developed by AHRQ was then shown as an example of how to use the communication tool from start to finish properly. The participant then repeated the same simulation while being encouraged to use the I- PASS- the-BATON tool. After completion of the second simulation, the researcher debriefed each participant. Finally, the participant completed the intent to use survey that assessed their intent to use the communication tool in their RRT role. The entire simulation-scenario 1, education on the tool, scenario 2, and debriefing- took approximately 30 minutes. The researcher provided all education and debriefing and attended a simulation facilitator class to increase their skill set in simulation facilitation.

Results

Twelve RRT nurses out of a possible 25 participated in the study. The majority of participants were female within the age range of 25-34 years. Fifty percent of the participants had two to five years of experience as a licensed nurse and two to five years as a critical care nurse. A majority of the participants (58.3 %) held the national certification of Critical Care Registered Nurse (CCRN). Twenty-five percent of the participants had less than 6 months of experience as an RRT nurse, 33.3% had two-four years and 33.3% had greater than seven years of experience. All 12 participants stated that they currently use SBAR as a communication tool. See Table 1 for complete demographic data.

The intent to use survey showed that 91.7% intended to use I-PASS-the-BATON in future RRT calls. The majority of participants (83.3%) agreed that this communication tool was easy to use. All the participants thought the instruction through HFS was effective and would like to use HFS in the future for education of RRT nurses. See Table 2 for complete results of the intent to use survey responses.

No association was found between demographic data and participants' intent to use the structured communication tool using exact chi-square tests. The intent to use structured communication tool survey consisted of six questions that were agree or disagree. Out of the twelve participants, two answers were left blank, and a total of five disagrees were recorded. Of those five disagree responses four came from the same participant. This participant was not distinguished, demographically, in any particular way from the other respondents in the sample.

Discussion

Participation in a HFS by 12 nurses working on RRTs in a rural, community hospital indicated that the majority of them intended to use a structured communication tool. The tool, I-PASS-the-BATON, was developed by AHRQ and although empirical evidence of effect is

lacking over 90% of study participants reported they would use this tool in future interactions with providers. This study was unique due to the fact that no studies were found that reported on the use of structured communication tools in HFS as means of specifically educating RRT nurses.

Results and Procedures

The results and procedures align with the studies completed by McCrory et al.[11] and Delac et al.[12]. Both studies involved two simulations with education and debriefing between each simulation and reported positive results similar to this study. McCrory et al.[11] studied the use of a handoff tool by pediatric interns. The researchers developed two scenarios for simulation in which the intern attended one simulation before education of the handoff tool and then one after. The interns performed more components of the handoff tool in a timelier manner and included more components of a handoff tool ($P< 0.001$) after the second simulation. Although, this study did not focus on the participants accuracy of completing I-PASS-the-BATON, the education method used between the two studies were similar. This study and McCrory et al.[11] performed an educational intervention and debriefing in between simulations. The study goals were very similar between the projects teaching a new structured communication tool. However, McCrory et al.[11]focused on the actual use of the tool instead of this study which focused on the intent to use the structured communication tool. Both studies indicated a positive result towards their study goal.

Delac et al.[12] and this study also had similar procedures. Delac et al.[12] studied medical surgical nurses who responded to codes within a hospital setting. Simulations were brought to various units in which two different scenarios were presented with debriefing in between. A pre- and post-survey given to the participants reported a 20.4% increase in confidence about their

hand off communication after the second simulation. Although, preintervention data was not collected in this study both studies completed two simulations with debriefing and had positive results pertaining to their study goals. In this study, the procedure allowed each participant the time to reflect about the simulations could possibly explain why the majority of participants agreed that they intended to use I-PASS-the-BATON during future RRT calls.

Simulation Design

This study's simulation scenario included a patient whose status deteriorated to closely resemble an RRT call. Comments obtained through the intent to use structured communication tool survey revealed that participants felt like the simulation scenario presented resembled frequent RRT calls at the practice site. The close resemblance of a RRT call gave each participant the ability to understand what it would be like to use a structured communication tool in an actual RRT call that might happen while working as a RRT nurse in the hospital. This could have allowed the participants to fully understand their feelings and honestly answer their intent to use I-PASS-the-BATON question.

Possible reasons why the participants' reported that the simulation was effective included theory based design of the HFS and debriefing, the real life set up of the simulation, and the consistent script based role of the provider and medical surgical nurse. The design of the simulation adhered to the Jefferies framework for simulation[13] which could be one reason why all the participants thought the simulation was effective and agreed that HFS should be used for future education of RRT nurses. Objectives were stated before beginning each simulation along with an extensive orientation of the simulation room including the equipment needed to take care of the patient. The simulation was high fidelity in which the mannequin spoke, had breath sounds, and demonstrated bleeding through the use of fake blood. There were cues such as a

drop in the patient's blood pressure, and altered mental status of the patient to trigger the RRT nurse to need to call the provider or provide interventions. The success of the simulation aspect of the educational intervention could explain why the majority of participants answered that they intended to use I-PASS-the-BATON on future RRT calls.

Structured Communication Tool

The structured communication tool, I-PASS-the-BATON, developed by AHRQ as part of the teamSTEPPS® curriculum was taught as the structured communication tool not SBAR. This was due to the site specific conditions that involved a very negative reaction to SBAR by RRT members. Thus, the researcher chose I-PASS-the- BATON as an alternate tool. Aspects from the teamSTEPPS® curriculum was specifically mentioned and used in the studies completed by Beebe et al.[14] & Kaplan et al.[15] The use of I-PASS-the-BATON as an alternate tool to SBAR decreased potential bias in this study that could have affected study results.

Strengths & Limitations

The major strengths of this study included the study of practicing RRT nurses, design and execution of the HFS based on a theoretical framework, and the study question that aimed to address the gap in evidence of the impact of HFS on RRT nurses communication skills. The methods of this project were carried out in a consistent manner including scripts for the simulation insuring that each participant had the same experience to decrease bias. Another strength was that the HFS was completed in consultation with two simulation experts to ensure that the design of the HFS adhered to Jefferies Framework for Simulation.

The limitations of this study included the single site and small sample size by convenience sampling with no control or randomization. The small sample size could be explained by the RRT nurses participating in the study on their own time and recruitment

strategies. Although incentives were offered it was not substantial. The pool of available RRT nurses was only 25 so the participation rate was 48%. There was also a change in leadership at the practice site that took place after completing this study affecting future study implications.

Conclusion

The results of this study showed that RRT nurses intended to use a structured communication tool in future RRT calls after completion of an educational intervention consisting of HFS. Though the number of RRT nurses who participated was small, almost 100% reported that they intended to use I-PASS-the-BATON on future RRT calls. These findings could be used to design future studies and to design orientation and education of RRT nurses. The implementation of a structured communication tool during RRT calls could prevent communication errors between a RRT nurse and provider and upon further research could potentially improve the function of the RRT nurse during an RRT call at a rural community hospital.

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"I PASS THE BATON"		
I	Introduction	Introduce yourself and your role/job (include patient).
P	Patient	Name, identifiers, age, sex, location.
A	Assessment	Present chief complaint, vital signs, symptoms, and diagnosis.
S	Situation	Current status/circumstances, including code status, level of (un)certainty, recent changes, and response to treatment.
S	Safety	Critical lab values/reports, socioeconomic factors, allergies, and alerts (falls, isolation, etc.).
THE		
B	Background	Comorbidities, previous episodes, current medications, and family history.
A	Actions	Explain what actions were taken or are required. Provide rationale.
T	Timing	Level of urgency and explicit timing and prioritization of actions.
O	Ownership	Identify who is responsible (person/team), including patient/family members.
N	Next	What will happen next? Anticipated changes? What is the plan? Are there contingency plans?

Figure 1. AHRQ "I PASS the BATON" communication tool.

Table 1

Characteristics of Rapid Response Team Nurses (N = 12)

	n	%
Age (years)		
25-34	8	66.7
35-44	1	8.3
45-54	3	25.0
Gender		
Female	10	83.3
Male	2	16.7
Years as a critical care nurse		
2-5	6	50.0
6-10	1	8.3
11-15	2	16.7
16-20	2	16.7
>20	1	8.3
Certified RN		
Yes	7	58.3
No	5	41.7
Time as a MET nurse[a]		
<6months	3	25.0
6 months – 1 year	1	8.3
2-4 years	4	33.3
>7 years	4	33.3

Note. MET= Medical emergency team.

[a] Time as a MET nurse does not add up to 100 percent due to rounding.

Table 2

Results of Intention to Use Structured Communication Tool (N = 12)

	n	%
Personal instruction effective		
Agree	11	91.7
Disagree	1	8.3
High fidelity simulation effective		
Agree	12	100
I-PASS-the- BATON easy to use		
Agree	10	83.3
Disagree	2	16.7
I-PASS-the-BATON effective		
Agree	9	75.0
Disagree	1	8.3
Missing	2	16.7
High fidelity simulation for future education of RRT nurses		
Agree	12	100
Intention to use I-PASS-the-BATON		
Agree	11	91.7
Disagree	1	8.3