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Empowering Nursing Staff to Activate Rapid Response Teams: Using *In Situ* Simulation to Bolster Knowledge and Confidence

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ABSTRACT

Purpose: To examine the impact of *in situ* simulation (ISS) with scripting on nursing staff's knowledge and confidence to initiate rapid response teams (RRTs) immediately after identifying patient condition deterioration.

Background/Significance: Failure to rescue (FTR) related to delays in activation of RRT is on the rise, leading to poor patient outcomes. Lack of confidence, knowledge, and empowerment are associated with delayed activation of RRTs. As such, the nursing staff's confidence is integral in activating RRTs and FTR prevention. *In situ* simulation may help nurses increase their confidence, thus empowering timely RRT initiation.

Methods: This quantitative pretest–posttest study used a convenience sample of nurses and nursing assistants. First, participants completed the Rapid Response Team Survey (RRTS) pretest. Then, they participated in the ISS scenario. Lastly, they completed debriefing and the RRTS posttest.

Results: Pearson's correlation results showed no significant relationships between the variables. Dependent *t*-test results showed statistically significant increases between the pretest and posttest means (Part I, $t = -5.51$, $p < .001$, $MD = 1.32$; Part 2, $t = -1.04$, $p < .01$, $MD = 3.1$). These results suggest that ISS with scripting increased participants' knowledge and confidence in early activation of RRTs. Additionally, staff reported feeling more confident and empowered regarding future RRT decision-making and communication with other healthcare colleagues.

Discussion: Early activation of RRTs prevents FTR. The results of this study suggest ISS with scripting increases staff's knowledge, confidence, and empowerment to activate RRTs. We recommend that hospital organizations adopt ISS with scripting to empower nurses to activate RRTs to prevent FTR.

Keywords: failure to rescue, rapid response teams, rapid response systems, deteriorating patient conditions, emergency medical teams, *in situ* simulation, scripting, confidence, knowledge, empowerment

INTRODUCTION

Failure to rescue (FTR) is a preventable pervasive issue in the acute care setting that negatively affects patient outcomes, as well as organizations' financial performance (Tilley & Spencer, 2020). Failure to rescue is a failure or delay in recognizing and responding to hospitalized patients' deteriorating conditions related to a disease process or medical intervention resulting in mortality or per-

manent damage (Patient Safety Network [PSNet], 2019; PSNet, n.d.; Hall et al., 2020a). A systematic review by Burke et al. (2022) revealed in-hospital FTR rates between 8% and 16.9%. Furthermore, in 2006, the Institute for Healthcare Improvement identified FTR as one of six key initiatives for the implementation of rapid response systems, thus playing a pivotal role in preventing FTR and an estimated 100,000 deaths. As such, FTR rates are a metric for hospital quality. In response to increased FTR incidences, rapid response systems (i.e., rapid response teams [RRT] or emergency medical teams) have been incorporated into hospital organizations' emergency response operations. Evidence shows that using RRTs reduces the number of FTR events (Hall et al., 2020b). Moreover, proper use of RRTs has been shown to decrease the number of cardiopulmonary arrest emergencies and FTR-related mortality rates (Jackson et al., 2016; Reardon et al., 2018).

Rapid Response Activation: The Roles of Knowledge, Confidence, and Empowerment

The purpose of RRTs is to provide early interventions that prevent avoidable morbidity and mortality in the non-intensive care hospital setting (Miller & Witgert, 2020). As the healthcare professionals responsible for 24-hour surveillance of hospitalized patients, registered nurses (RN) play a unique role in identifying clinical changes in patients' conditions (Brown et al., 2012). However, evidence shows that nursing staff may delay the activation of RRTs (Azimirad et al., 2021; Burke et al., 2022; Hamlin et al., 2023). Tilley and Spencer (2020) asserted that RRTs are only as effective as the individuals activating them, outlining the following as barriers to RRT activation:

1. A lack of consistent RRT education among nurses,
2. The established interdisciplinary hierarchy, or chain of command, in the hospital,
3. An uncertainty about when to call the RRT if clinical deterioration is subtle or gradual rather than abrupt,
4. A perceived need to justify a decision to call the RRT,
5. The increased workload for both the ICU nurse and the medical–surgical nurse,
6. Negative past experiences with RRTs,
7. An unsupportive unit culture, and
8. Less nursing experience (p. 54).

Other barriers potentially contributing to delays in initiating RRTs may be related to the nursing staff's lack of empowerment (the decentralization of authority [Al-Dmour et al., 2018]) and confidence to initiate RRTs related to negative attitudes or responses from the RRT members. Verrillo and Winters (2018) reported that in a survey of new graduate nurses, the top concerns related to initiating RRTs were lack of confidence, fear of harming the patient, and fear of inability to handle the workload. Furthermore, nursing staff's empowerment is influenced by their perceptions of confidence and competency, subsequently influencing job performance (Al-Dweik et al., 2016; Azimirad et al., 2021; Alharbi & Alrwaitey, 2022; Burke et al., 2022; Rao et al., 2017; Ta'an et al., 2020; Tyagi & Shah, 2018). Therefore, increasing confidence is imperative to empowering nursing staff to initiate RRTs immediately upon identification of patients' deteriorating conditions, thus preventing FTR and its associated negative sequelae. Nevertheless, while RRT literature related to RNs is abundant, RRT literature related to certified nursing assistants (CNA) is sparse.

Training opportunities designed to review nursing staff-driven protocols potentially maximize autonomy in a healthcare organization while also providing the opportunity to identify other factors impacting practice, such as the communication dynamics during patient deterioration, of which little is known (Rao et al., 2017; Wong et al., 2017). Therefore, using simulated rapid response scenarios in the hospital setting may be a viable solution to

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build nursing staff confidence, thus empowering them to initiate a RRT upon immediately identifying early signs of patient deterioration.

Hospital-Based *In Situ* Simulation

Pedagogical strategies using case studies and simulation may assist by empowering nurses through building confidence, self-efficacy, and autonomy in making decisions related to initiating life-saving nurse-driven protocols—such as RRTs—thus improving patient outcomes (Atherton et al., 2020; Brown et al., 2012; Helt et al., 2020; Karageorge et al., 2020; Lee et al., 2019; Mak et al., 2022; Morfoot & Stanley, 2018; Norris et al., 2019). Furthermore, evidence shows that using simulation is an effective pedagogical method for promoting active learning within a safe environment while cementing critical nursing skills (Cant et al., 2020; Lewis et al., 2019). Although the benefits of using simulation for building nursing knowledge and skills in the academic setting are well-represented in the literature, studies using simulation in the post-academic practice (hospital) setting are sparse.

A systematic review showed improved patient safety outcomes in all the studies that investigated the effects of simulation training for acute care nurses (Lewis et al., 2019). Though this evidence supports simulation for the hospital setting, Lewis et al. (2019) asserted that more high-quality research studies include standardized high-risk scenarios with standardized, validated instruments. Furthermore, the authors recommended that future research investigate various demographic and interdisciplinary team factors that could lead to different simulation training outcomes. Similarly, Cant et al. (2020) completed a scoping review of studies investigating the effects of simulation-based education for hospital nurses. The review results showed several simulation-based education programs for hospital nurses focusing on patient safety standards. However, the researchers reviewed studies from only one simulation journal, all of which only investigated the immediate outcomes of the simulation programs. They proposed that future research should investigate longitudinal outcomes of simulation programs. Additionally, *in situ* simulation (ISS), or "simulations that occur in the actual clinical environment and whose participants are on-duty clinical providers during their actual workday" (Patterson et al., 2008, p. 1), is an ideal simulation pedagogy for use in the hospital setting. Therefore, the purpose of this study was to examine the impact of ISS with scripting on the nursing staff's knowledge and confidence to initiate RRTs immediately following the identification of patient condition deterioration. In this study, RNs and CNAs are included as one group because the hospital's policy for initiating RRTs is identical for all nursing staff; nurses or CNAs may autonomously initiate RRTs upon identification of deterioration of patient condition.

METHODS

Design, Sample, and Setting

This was a quasi-experimental pretest–posttest study. The target population included registered nurses (RNs) and CNAs working on medical-surgical type/non-intensive care units, with a convenience minimum sample size of 24 RNs and CNAs currently working at a South Florida community hospital. An *a priori* power analysis was conducted to determine the minimum sample size (two-tailed, power = .95, effect size = .30, $p \leq .05$). The inclusion criterion was RNs and CNAs working on medical-surgical/non-intensive care units. The exclusion criterion was RNs and CNAs working in intensive care units, the emergency department, perioperative services, postpartum units, and outpatient departments.

Instrument

The Rapid Response Team Survey (RRTS) is a three-part instrument (Brown et al., 2012). The author granted permission to use the RRTS in this study (Table 1). Part 1 consists of four patient deterioration

Table 1

The Rapid Response Team Survey: Part 1 and Part 2

RRTS	Item	Response Options
Part 1	**Q1.** A 65-year-old man was admitted for an elective total hip replacement. His admission vital signs were blood pressure (BP) of 120/70 mm Hg, heart rate (HR) of 72 beats/min, and respiratory rate (RR) of 18 breaths/min, and he has been up in the chair. He now complains of midsternal chest pain. He is cold and clammy with a BP 100/60 and RR 24. His radial pulse is thready; apical pulse is 50 and regular. *First, you would:* **Q2.** A 35-year-old man is admitted postoperatively after a ruptured appendix. He is stable upon arrival to the unit. His initial vital signs were BP 110/60, HR 80, and RR 18 and was afebrile. Eight hours after procedure, his vital signs are now BP 92/58, HR 110, RR 26, and temperature 38.6-C. He complains of increased abdominal pain. His intravenous fluids are at 100 mL/h. *First, you would:* **Q3.** A 21-year-old man was admitted 1 day ago with a diagnosis of severe asthma. He has responded well with nebulizer treatments and steroids. His vital signs have been stable. Four hours ago, he began to request nebulizer treatments hourly, and now his RR rate is 40 breaths/min. His oxygen saturations are 90% on 15 L on nonrebreather mask. *First, you would:* **Q4.** A 60-year-old man is admitted with a diagnosis of anemia. His hemoglobin in the emergency department was 10. A bowel prep has been initiated in preparation for an esophagogastroduodenoscopy and colonoscopy in the morning. While consuming the liquid bowel prep, the patient has an emesis of a coffee-ground-type material. His vital signs remain stable, and his hemoglobin results are now 9.9 g/dL. *First, you would:*	• Call a colleague • Continue to observe, repeating your assessment in 10 minutes • Activate Code Rescue • Call the physician • Consult the unit nurse practitioner • Consult the unit supervisor
Part 2 Prompt: The following items are associated with a nurse or clinical partner activating the code rescue. Read each one. Circle the rating that most closely matches how important the item is for to you.	**Q1.** Physician's positive response. **Q2.** My knowledge of code rescue criteria. **Q3.** My knowledge of the process for calling the code rescue. **Q4.** My ability to determine if the patient's condition meets the code rescue criteria. **Q5.** The way a nurse is treated by the rest of the unit staff after calling the code rescue. *(Reverse scored)* **Q6**. The hospital leadership commitment to support nurses who call code rescue. **Q7.** The knowledge of how to call the code rescue. **Q8.** Physician's negative response. *(Reverse scored)* **Q9.** My understanding of the code rescue criteria. **Q10.** My assessment of the need for calling the code rescue.	• Never • Rarely • Occasionally • Regularly • Always • Extremely

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scenarios to assess participants' knowledge of when to initiate the RRT (i.e., Code Rescue) (Table 1). Each scenario has six response options: 1) Call a colleague, 2) Continue to observe, repeating your assessment in 10 minutes, 3) Activate Code Rescue, 4) Call the physician, 5) Consult the unit nurse practitioner, and 6) Consult the unit supervisor. The desired response for all scenarios was "Activate Code Rescue."

Part 2 is a 10-item six-point Likert-type scale to assess participants' comfort, confidence, and empowerment with initiating the RRT. Each statement's level of importance is rated as one of six response options (6 = *Extremely*, 5 = *Always*, 4 = *Regularly*, 3 = *Occasionally*, 2 = *Rarely*, and 1 = *Never*). The desired response option for eight items was *Extremely*. Alternately, items 5 and 8 are reverse scored with *Never* as the desired response option (Table 1). The reported Cronbach's value for Part 2 was .89 (Brown et al., 2012). In this study, the Cronbach's values for Part 2 pretest and posttest were .74 and .83, respectively.

Identical versions of RRTS Part 1 and Part 2 were administered at the pretest and posttest phases. Part 3 consisted of a demographic questionnaire administered in the pretest phase and one open-ended question administered in the posttest phase.

Ethical Considerations

The healthcare system's Institutional Review Board (IRB) approved the study in December 2019 (IRBNet ID 1470317).

Data Collection

The ISS sessions were delayed during the COVID-19 pandemic as restrictions limited in-person meetings to only those essential for direct patient care to minimize the risk of staff exposure. As such, data were collected from June 2021 through November 2021. Recruitment of participants consisted of personal invitations, posted flyers, and announcements at staff meetings. Additionally, the principal investigator (PI) sent electronic mail (email) invitations and reminders via the hospital-specific email system. The flyers included ISS session dates, times, and locations. Sessions were available for eight hours on five different days, providing participants with the flexibility to attend on a "walk-in" basis. Each ISS with scripting session was approximately 20 to 25 minutes.

Upon arrival to the session, each participant was given the informed consent form. Each participant completed the RRTS pretests and demographic information. This was followed by orientation to and participation in the simulation session, hot debriefing, and administration of the RRTS posttest. Orientation included reviewing the purpose and expectations of the simulation, the RRT protocol and criteria, and suggested scripting for responding to unprofessional behaviors during the RRT. Pretests and posttests were numbered at the top for data analysis tracking purposes. The PI and research team members ensured that each participant's pretest and posttest numbers were the same.

In Situ Simulation Sessions: Design, Planning, and Training

A nursing simulationist assisted with the development of the ISS to ensure fidelity. The patient and attending physician were key simulation roles. The nursing simulationist served as the standardized patient, and research team members alternated as the attending physician. All research team members attended simulation training with the nursing simulationist. The PI collaborated with a nursing administrator and department leaders to secure and coordinate a vacant patient room and emergency code equipment for each session. The duration of each session was dependent upon the participants' responses to the scenario. The simulation ended when participants demonstrated knowledge, confidence, and empowerment or when the PI or nursing simulationist deemed the

scenario was not progressing.

Data Analysis Plan

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics were used to determine frequencies, means, standard deviations, and ranges for demographic information and RRTS survey items. A dependent *t*-test was used for inferential analysis of RRTS pretest and posttest score differences. For RRTS Part 1, the scores were binarily coded—"Activate Code Rescue" was coded as "1," and all other answer choices were coded as "0." Statistical significance was set at $p \leq .05$.

RESULTS

Participants

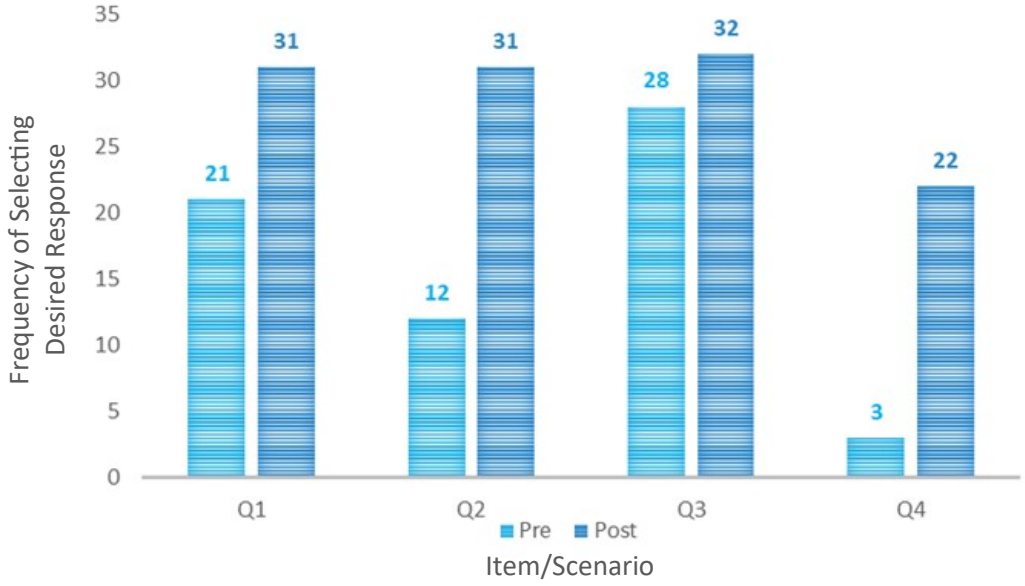
Fifty-two nursing staff participated in the study: 79% (*n* = 41) RNs, 19% (*n* = 10) CNAs, and one unspecified "other" role. Participants' years working at their current hospital ranged from less than one to 21 (*M* = 5.41, *SD* = 5.29). Thirty-five percent of participants (*n* = 18) reported less than one to four years of experience in healthcare (five to nine years = 26% [*n* = 13]; 10 to 19 years = 27% [*n* = 14]; and 20 years or greater = 12% [*n* = 6]). Most participants (65%, *n* = 33) worked on medical-surgical units, 14% on clinical decision/observation units (*n* = 7), 10% on pulmonary units (*n* = 5), 8% on oncology units (*n* = 4), 2% on orthopedic-neurology units (*n* = 1), and 2% on "other" non-specified units (*n* = 1). The participants' levels of education were 39% Bachelor of Science in Nursing (*n* = 20), 21% Master of Science in Nursing (*n* = 11), 17% Associate of Science in Nursing (*n* = 9), 6% Diploma in Nursing (*n* = 3), and 17% high school diploma (*n* = 9). Additionally, 17% of the participants reported having specialty certifications (*n* = 9). Most of the participants (80%, *n* = 39) indicated they had experience with initiating RRTs.

Descriptive Statistics

The results of the descriptive statistical analysis of the RRTS showed an increased selection of favorable responses following participation in the ISS with scripting session. In Part 1 of the RRTS, knowledge is measured by evaluating responses to four written scenarios (Q1, Q2, Q3, Q4), which showed increases in the favorable response of "Activate Code Rescue" (Figure 1). The overall average

Figure 1

RRTS Part 1 Pretest and Posttest Selection of the Desired Response by Item



Note. Desired response was "Activate Code Rescue."

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score for Part 1 increased from 1.74 (pretest) to 3.05 (posttest). In Part 2, confidence is measured by evaluating the responses for 10 self-report Likert-type items, which showed an increase in the favorable responses (Figure 2). *Extremely* was the favorable response option for eight items (Q1, Q2, Q3, Q4, Q6, Q7, Q9, Q10); items Q5 and Q8 were reverse scored with *Never* as the favorable response. The overall average score for Part 2 increased from 50.8 (pretest) to 53.9 (posttest).

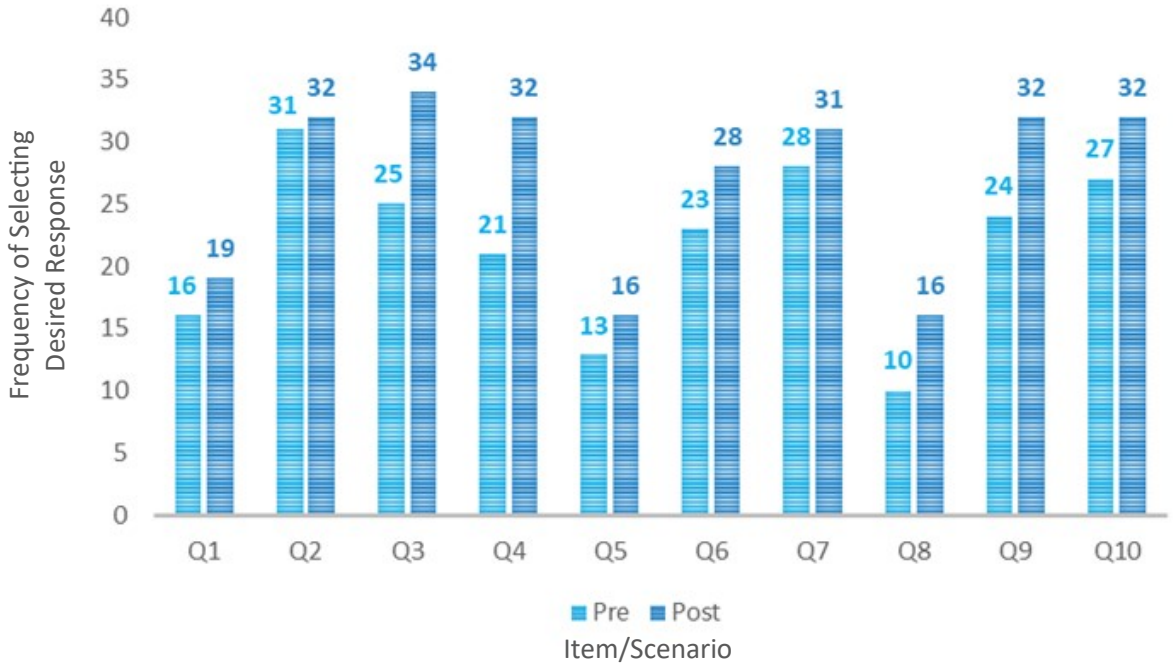
Dependent *t*-Test

The dependent *t*-test results showed statistically significant differences between the pretest and posttest scores of individual items and overall scores of RRTS Part 1 and RRTS Part 2 (Table 2). A statistically significant difference was revealed between the pretest and posttest overall means for RRTS Part 1 (t = -5.51, p < .001, MD = 1.32, SD = 1.47). Individual item analysis showed statistically significant mean differences for three of the four items: item one (t = -3.22, p < .01, MD = .26, SD = .50), item two (t = -5.47, p < .001, MD = .45, SD = .50), and item four (t = -5.53, p < .001, MD = .50, SD = .56).

A statistically significant difference was found between the pretest and posttest overall means for RRTS Part 2 (t = -1.04, p < .01, MD = 3.1, SD = 5.78). Part 2 score differences were statistically significant for five of the 10 items: item three (t = -2.68, p = .01, MD = .24, SD = .58), item four (t = 3.10, p < .01, MD = -.45, SD = .50), item five (t = -2.32, p = .03, MD = -.32, SD = .91), item nine (t = -2.94, p < .01, MD = .30, SD = .67), and item 10 (t = -2.61, p = .01, MD = .27, SD = .69). The difference between pretest and posttest averages for item six was approaching statistical significance (t = -1.94, p = .06, MD = .18, SD = .62).

Figure 2

RRTS Part 2 Pretest and Posttest Selection of the Desired Response by Item



Note. Desired response was *Extremely* for Q1, Q2, Q3, Q4, Q6, Q7, Q9, Q10; desired response for the reverse scored items (Q5 and Q8) was *Never*.

Table 2

Dependent t-Test Analyses of Pretest and Posttest RRTS Responses by Individual Items and Overall Means

RRTS Scores	Correlation		*t* statistic			Means			
	r	*p*	*t*	*p*	Cohen's *d*	Pre	Post	*MD*	*SD*
Part 1 By Item									
Q1	.39	.02	-3.22	.003	.50	.55	.82	.26	.50
Q2	.36	.03	-5.47	< .001	.51	.37	.82	.45	.50
Q3	.23	.16	-1.28	.21	.51	.74	.84	.11	.51
Q4	.05	.76	-5.53	< .001	.56	.08	.58	.50	.56
Part 2 by Item									
Q1	.70	< .001	-.52	.60	1.16	4.57	4.66	.09	1.16
Q2	.35	.02	.18	.86	.85	5.61	5.59	.02	.85
Q3	.54	< .001	-2.68	.01	.58	5.48	5.71	.24	.58
Q4	.26	.09	-3.01	< .01	.79	5.33	5.70	.37	.79
Q5	.74	< .001	-2.32	.03	.91	4.89	5.20	.33	.91
Q6	.73	< .001	-1.94	.06	.62	5.32	5.50	.18	.62
Q7	.33	.03	-1.57	.12	.96	5.41	5.64	.23	.96
Q8	.59	< .001	-1.68	.10	1.55	4.23	4.63	.40	1.55
Q9	.52	< .001	-2.94	< .01	.67	5.39	5.68	.30	.67
Q10	.55	< .001	-2.61	.01	.69	5.41	5.68	.27	.69
Overall									
Part 1	.28	.08	-5.51	< .001	1.47	1.74	3.05	1.32	1.47
Part 2	.56	< .01	-1.04	< .01	5.78	50.8	53.9	3.09	5.78

Note: *MD* = mean difference; *SD* = standard deviation.

RRTS Part 3: Open-Ended Responses

Thirty-two participants responded to the posttest open-ended question: "As a result of this training, what changes would you make in your practice?" Participants' responses aligned with one of the two following categories: *increased awareness and recognition of urgency to take immediate action* and *increased confidence and empowerment to initiate an immediate Code Rescue*. Table 3 contains the participants' categorized verbatim responses.

DISCUSSION

The purpose of this study was to examine the impact of ISS with scripting on nursing staff's knowledge and confidence to initiate RRTs immediately following the identification of patient condition deterioration. The quantitative results of the study suggest ISS with scripting increases staff's knowledge and confi-

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Table 3

Participants' Verbatim Responses to the Open-Ended Question

Category	Responses
Increased awareness and recognition of urgency to take immediate action	• "Calling code rescue when it meets criteria and be confident when code rescue called." • "Call the code ASAP." • "Calling code rescue earlier when patient is deteriorating/change of status." • "Call a code rescue if I am concerned about the patient." • "A better appreciation of the importance of calling a code rescue without hesitation." • "I would initiate a code rescue earlier in my assessment." • "Prevent delays in calling code rescues." • "Raise concern for a patient sooner." • "Call a code rescue when criteria is met." • "Activate code rescue as soon as possible, if patient is showing any signs of distress." • "Increase code rescue usage." • "Call a code rescue." • "Patient S/S are very important." • "Call a code prior to patient deterioration such as change in vital signs. Call when there is a change in baseline." • "Act faster [to] call a code." • "Call codes." • "Better understanding."
Increased confidence and empowerment to initiate an immediate Code Rescue	• "Confidently discuss with physician for code when reason questioned why code was called." • "Being more confident and not afraid of calling a code." • "More confident to activate code rescue." • "I will work on my confidence in calling Code Rescue when my 'gut' tells me I should." • "Encourage staff to be confident in their decision-making and stand behind their decisions." • "Not to doubt yourself and advocate for the patients." • "Have more confidence in calling a code." • "Be more confident." • "Speak up more." • "Feeling more comfortable calling a code rescue without feeling like I will get reprimanded." • "Be more empowered to call a code rescue." • "To feel empowered to call a code rescue." • "It makes us less worry about when to call a code rescue and reassure us that it is better to be safe than sorry."

dence to activate RRTs. These results align with other recent studies examining simulation pedagogy to increase knowledge, confidence, and empowerment related to nursing skills and practice (Aguirre et al., 2023; Almeida et al., 2019; Araújo et al., 2022; Fitze & Goodroad, 2022; Helt et al., 2020; Lee et al., 2019; Morfoot & Stanley, 2018; Patel et al., 2022; Sami et al., 2019; Yun & Choi, 2022).

Knowledge

The dependent *t*-test results for RRTS Part 1 showed statistically significant increases in the overall mean score, suggesting increased knowledge in identifying deteriorating patient conditions and increased propensity for immediate RRT activation following participation in the ISS session. Although individual item analysis showed statistically significant increases for items one, two, and four, there was an insignificant increase for item three. These results warranted a review of the RRTS Part 1 item scenarios summarized as follows (Table 1)— Q1: 65-year-old male, post-hip arthroplasty with chest pain; Q2: 35-year-old male, post-appendectomy with severe abdominal pain and hypotension; Q3: 21-year-old, severe asthma with respiratory distress and low oxygen saturation level; and Q4: 60-year-old male, anemia with an episode of coffee-ground emesis. In comparison, all the patient conditions in the scenarios warrant equal urgency for RRT activation; therefore, inequality of patient condition severity does not explain the insignificant increase. However, the pretest means for items one, two, and four were markedly lower (.55, .37, and .08, respectively) than item three (.74) (Table 2). This could explain the significant increases for only three of the four scenario items. Despite its statistical insignificance, the increased mean score for item three indicates an overall increased propensity for RRT activation over other response choices. Cumulatively, these results suggest increased knowledge related to RRT activation after participation in the ISS with scripting sessions.

Confidence and Empowerment

The statistically significant increases in RRTS Part 2 pretest and posttest overall means and five of the 10 individual items (three, four, five, nine, and 10) (Table 2) suggest increased confidence and empowerment. The items in Part 2 assessed the importance of factors that affected the nursing staff's decision to activate the RRT. The individual item analysis results indicate that the nursing staff's confidence increased primarily related to the identification of deteriorating patient conditions, familiarity with RRT criteria protocol, and urgency for RRT activation. Individual item analysis results imply that nursing staff were more inclined to disregard the potential for RRT members' negative behaviors related to their decisions for RRT activation. While some of the individual items did not show statistically significant differences, cumulatively, the results suggest increased confidence after participation in the ISS with scripting sessions.

Additionally, the categorization of the qualitative responses to the open-ended question—*increased awareness and recognition of urgency to take immediate action* and *increased confidence and empowerment to initiate an immediate Code Rescue* (Table 3)—supports the quantitative results. Following participation in the ISS with scripting sessions, the qualitative responses imply that nursing staff felt more confident and empowered to autonomously activate the RRT immediately.

Scripting

Scripting was a vital component of the ISS pre-simulation orientation, which included professional scripted responses to inappropriate behaviors by healthcare professionals responsible for responding to RRTs (e.g., RRT members and physicians). Allowing the nursing staff the opportunity to learn the scripting prior to each session and rehearse it during the simulated RRTs may have contributed to

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their increased confidence and empowerment.

Limitations

Although the study was rigorously conducted, several limitations were identified. Data collection was primarily completed using a self-report instrument, which may have contributed to response bias for RRTS Part 2 (confidence). Consequently, there may be inaccuracies related to increased post-simulation confidence levels, as participants may have selected their answer choices based on how they think the researchers wanted them to respond rather than their genuine responses. Other limitations involved the setting, sampling method, and sample size. The generalizability of the results is cautioned as this was a single-site study using a small, non-randomized sample. Lastly, although all researchers were trained in the management of the ISS sessions, there may have been inconsistencies because researchers rotated the responsibility of role-playing and guiding the sessions. We recommend replication of this study and encourage future researchers to consider these limitations as they develop their own ISS studies.

Recommendations for Practice and Research

Research shows that active teaching methods lead to higher rates of knowledge retention (group discussion, 50%; practice, 75%; teaching others, 90%) (Colman, 2022; Ebbinghaus, 1885/2013; Karpicke & Roediger, 2008; Mueller & Oppenheimer, 2014). *In situ* simulation is an active teaching method shown to cement knowledge. Therefore, we recommend establishing regularly scheduled RRT ISS sessions with scripting throughout the year and incorporating RRT ISS training into nursing staff's annual competencies. We also recommend using ISS in studies and programs related to other high-risk/low-frequency nursing skills, practices, and encounters to encourage knowledge retention and ongoing skills practice.

CONCLUSION

Failure to rescue is a severe and preventable issue in hospital organizations that leads to adverse sequelae in patient safety, morbidity, mortality, and organizational financial health. Rapid response systems were designed to provide nursing staff with support upon identification of patients' deteriorating conditions. However, nursing staff may delay the activation of RRTs due to barriers related to a lack of knowledge, confidence, and empowerment. The use of simulation pedagogy has been shown to increase all three; the results of this study support this finding. We recommend hospital organizations consider adopting ISS with scripting to empower nursing staff to activate RRTs, thus preventing FTR.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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