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Increasing Nurses' Comfortability Using The Defibrillator

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by

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Abstract

The educational needs of nurses vary depending on the practice setting in which he or she is employed. Some competencies are taught yearly or bi-yearly. The current process for registered nurses to learn how to use the defibrillator is through the advanced cardiovascular life support (ACLS) training they are required to take every 2 years. Although a certification proves a nurse is competent in a certain area, skills tend to be forgotten over time. It is often noted “if you don’t use your skills, you lose them.” Nelson and Aguirri (2020) reported even though there are many facets to the code blue protocol, high quality cardiopulmonary resuscitation (CPR) and early defibrillation continue to be the cornerstone of survival. Will providing an educational session on the use of the defibrillator increase knowledge and confidence of registered nurses (RN) on the cardiac care unit? Registered nurses (RN) completed a mandatory educational session on the usage of the defibrillator during a code blue with hands-on instructions. As a result of this project, nurses had an increase in knowledge and felt more comfortable with using a defibrillator during a code blue after the educational session and hands on instruction.

Keywords: defibrillation, cardiopulmonary resuscitation (CPR), advanced cardiovascular life support (ACLS), cardiac arrest, registered nurses (RN) training

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Introduction

The educational needs of nurses vary depending on the practice setting in which he or she is employed. There are required competencies taught yearly or bi-yearly; however, being competent at a skill does not always equate to nurses being comfortable using those skills when needed. Nurses need the knowledge, understanding, guidance, education, and confidence to perform their jobs to the highest level of quality possible.

Problem Recognition

During the Covid pandemic, the number of staff allowed in the room during a code blue was limited. This was common practice due to the risk of exposure and limited knowledge about the implications of the Covid virus. Prior to the pandemic, extra staff members were allowed in the room and could witness experienced nurses performing the duties involved in running a successful code blue. A code blue is run when any healthcare provider finds a patient who is not breathing, has no pulse, or is unresponsive. If the nursing staff does not feel confident in their skills related to the use of defibrillators, negative outcomes can occur for patients, as defibrillation is a vital part of survival for patients. As a result, registered nurses (RN) on the cardiac care unit (CCU) have voiced concerns about using the defibrillator and have emphasized their heightened fear and insecurities about the effects their lack of knowledge can have on patients.

Problem Statement

Registered nurses on the cardiac care unit (CCU) identified defibrillator usage during a code blue as an area of weakness for them. Because of this, they were reluctant to serve in that role during code blue situations and would perform other duties they were more comfortable with. Will providing an educational session on the use of the

defibrillator increase the knowledge and confidence of registered nurses (RN) on the cardiac care unit (CCU)?

Literature Review

Einav et al. (2018) concluded nurses are more likely than any other healthcare member to find a patient in cardiac arrest. Because of this, the training nurses receive for basic and advanced life support, as well as defibrillator operation, makes them an essential member of the team in a code blue response (Einav et al., 2018). One part of the code blue process is knowing how to properly apply the defibrillator pads, choose the correct defibrillator mode, determine which lead reading is needed to visualize a rhythm, as well as place the defibrillator in shock mode or pace mode. Clearly, there are a lot of components to effectively use a defibrillator. A study by Bircher et al., (2019) found while early initiation of cardiopulmonary resuscitation (CPR) increased survival rates, a delay in defibrillation had a negative impact on outcomes. Although healthcare interventions have improved by leaps and bounds, code blue survival rates are still as low as 20% (Bircher et al., 2019). Code blue interventions, when performed correctly, could increase patients' survivability by 26% (Ekwantoro et al., 2020). A retrospective study reviewed by Einav et al. (2018) concluded even though 25% of in-hospital cardiac arrests had shockable rhythms, only 1/3 of them received defibrillation correctly. Is it possible during some of those codes, the nurses were not comfortable enough with using the defibrillator to correctly perform the intervention? Despite algorithms used to assess risk factors and strategies to help with early recognition and intervention, in-house cardiac arrest continues to pose a serious problem, with studies showing nearly ten codes occurring out of every 1,000 patients (Ocak & Tascanov, 2021). Although a certification

proves a nurse is competent in a certain area, skills tend to be forgotten over time. It is often noted, “If you don’t use your skills, you lose them.” Nelson and Aguirri (2020) reported that even though there are many facets to the code blue protocol, high-quality CPR and early defibrillation continue to be the cornerstone of survival. It can be said with certainty, there are knowledge gaps within the community of healthcare providers that must be acknowledged and overcome in order to improve the effectiveness of in-hospital resuscitation (Einav et al., 2018). Certainly knowledge, skills, and experience will affect the code blue outcome, but these things will also influence the decision-making process (Munawaroh et al., 2020), which is already a high-stress situation. Due to the unpredictable nature and high risk of a code blue, it is imperative registered nurses (RN) participate in frequent education and ongoing training to maintain competency and comfort for such events (Nelson & Aguirri, 2020).

Needs Assessment

After speaking with multiple nurses, the unit manager, unit educator, and other administrative supervisors, a major area of concern identified was the cardiac care nurses’ lack of comfort in using the defibrillator during code blues. Specifically, the educator for the cardiac care unit (CCU) felt there was a gap in the knowledge of the nurses, especially with the amount of recently hired travel nurses and new graduate nurses. The cardiac care educator was a strong advocate for education surrounding the correct usage of the defibrillator and believed it would be extremely beneficial.

Population

The population consisted of all night shift registered nurses (RN) working on the cardiac care unit (CCU) within the target community. All RNs working the night shift on

the CCU attended one of four educational sessions regarding how to utilize a defibrillator. Participation in the educational session was mandatory for the night shift RNs on the CCU; however, participation in the project with the completion of the pre and post intervention surveys was voluntary.

Stakeholders

Stakeholders for the project included staff nurses, unit managers, unit directors, members of nursing administration and hospital administration, patients, and community members. The patients would ultimately reap the most rewards with the correct use of the defibrillator being the difference between life and death. The nurses working on the unit would also be major stakeholders because this project's goal was to increase their knowledge and confidence in utilizing the defibrillator during a cold blue. Additionally, community members would be key stakeholders as local healthcare consumers.

SWOT Analysis

Strengths

- Supportive nursing leadership
- An educator allotted specifically for each unit.
- Staff nurses are sincerely motivated to learn, grow, and continue to improve their practice.

Weaknesses

- Lower than normal patient satisfaction scores
- Shortage of staff
- Limited resources

Opportunities

- Unit-based educators who can own the charge of ensuring staff nurses' competency.
- Promote a culture of learning at the start of being hired (initial training) with continual competencies.
- To positively increase negative outcomes

Threats

- Nursing shortages will continue to get worse after the pandemic.
- New education will be negatively received because the staff burn out.
- More and more staff nurses are being replaced by travel nurses.

Available Resources

Within the target community, there was a director, manager, and educator for the cardiac care unit (CCU). The educators and clinical supervisors for each unit oversaw staff competencies. Additionally, a quality improvement team completed mock drills and simulations within the target community throughout the year to build on the nursing staff's knowledge and hands-on skills. The target community is equipped with conference rooms to hold the educational session. The conference rooms are equipped with electronic devices (computer and whiteboards) for viewing the PowerPoint presentation.

Outcomes

The desired outcome for this project was nurses' confidence in using the defibrillator during codes would be increased. One expectation the results of the pre and post surveys about the target population would note a positive change in his or her

comfortability in using the defibrillator. Additionally, the target population would show measurable growth in the nurses' knowledge and skills.

Team Selection

The project consisted of a project leader, a project chair, and a practice partner. The project leader is a registered nurse (RN) enrolled in a Doctor of Nursing Practice (DNP) program. Working alongside the project leader was the project chair who is a doctorate-prepared nurse practitioner and full-time professor. The practice partner for the project was a Master of Nursing (MSN) prepared director of nursing support at the target community.

Scope of the Project

Of all members of the healthcare team, nurses are the most likely to find a patient in cardiac arrest (Einav et al., 2018). Nurses are required to stay up to date on policies and procedures. Competencies allow nurses to stay up to date on policies and procedures. Yearly competencies are completed with registered nurses on the cardiac care unit; however, check off on the use of the defibrillator is not always part of these competencies. Aside from taking an advanced cardiac life support (ACLS) certification class bi-annually, practicing on their own, or working the occasional code blue, nurses on the cardiac care unit lack the education and feedback needed to feel confident with defibrillator usage. Registered nurses on the cardiac care unit have voiced their concern surrounding the lack of continual education on defibrillator usage and would like more educational opportunities with hands-on instructions.

Cost/Benefit Analysis

Table 1

Cost/Benefit Analysis

Costs	$ Amount	Benefits
Professional Fee	$500.00	Increased RN Retention
Staff	$1,500.00	Increased Patient Satisfaction
Supplies & Materials	$200.00	Increased Hospital Image in Community
Total	$2,200.00	Priceless

Goals, Objectives, and Mission Statement

Goals

The goal of this project was to increase nurses' knowledge and confidence when utilizing the defibrillator during codes. Creating strong, confident, competent nurses provides a positive environment of care for patients, allowing them to relax and rest in the comfort of knowing they have the best nurses taking care of them. This level of safety and security promotes healing and well-being for the patient.

Objectives

The objectives of this project were:

- Participants will have increased knowledge in the use of a defibrillator.
- Participants will feel more confident in using a defibrillator.

Mission Statement

The project was designed to provide education and resources to registered nurses (RN) on the Cardiac Care Unit (CCU), thus furthering their understanding and

knowledge of how to comfortably use the defibrillator during a code blue. By providing an educational session with hands-on learning and defibrillator resources, the nurses were empowered with the tools needed. The information led to increased confidence when performing critical duties pertaining to the nurse's role during a code blue when utilizing the defibrillator.

Theoretical Underpinnings

The theory used to help guide this project was Levine's Conservation Model. Mary Levine's theory was based on her belief that behavior is influenced by the environment (Zaccagnini & Pechacek, 2021). In writings about her theory, Mary went on to explain learning everything one can about an environment is a form of self-preservation and one of the ways nurses actively participate in their patient's environment (Zaccagnini & Pechacek, 2021). Based on Levine's Conservation Model, "the care provided by the nurse is an attempt to restore and strengthen the patient to help them get through challenging times and difficulties" (Zaccagnini & Pechacek, 2021, pp. 18-19). Levine's theory was applicable to this project. Registered Nurses (RN) on the target unit noted hesitancy and discomfort within their work environment related to utilizing the defibrillator in emergency situations. By educating the RNs and providing support to them during learning activities, the nurses' knowledge base on defibrillator usage would be enhanced thus leading to increased confidence and comfort when utilizing this equipment during emergencies.

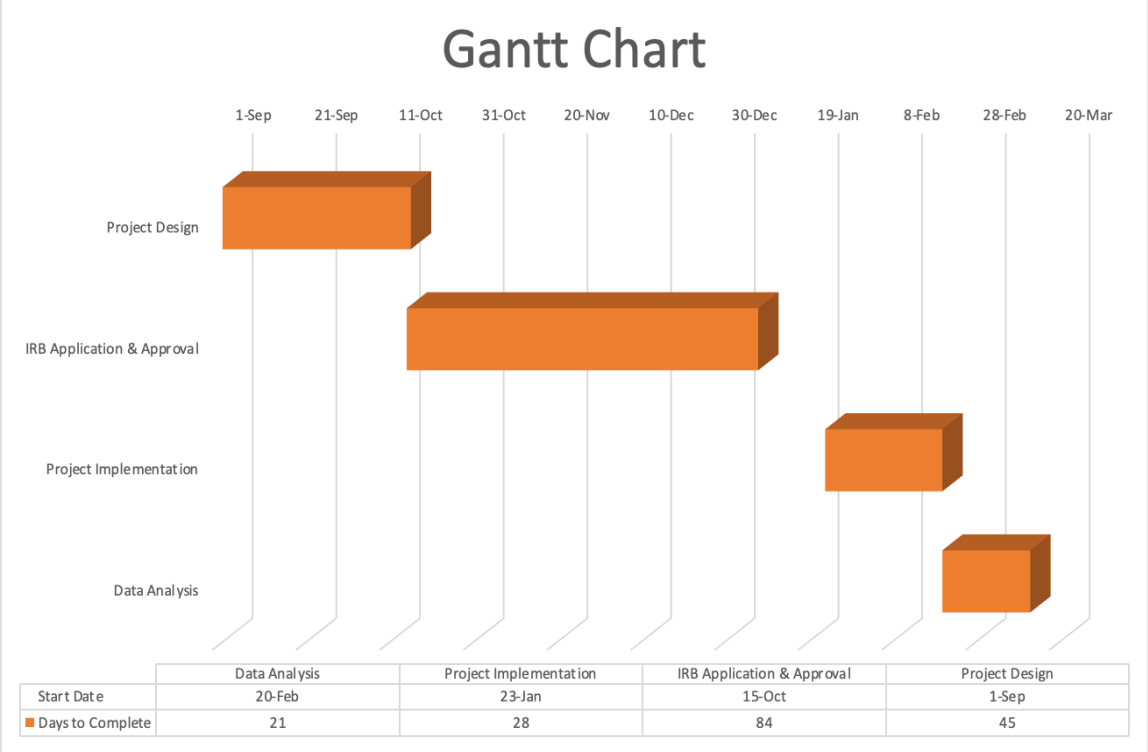
Work Planning

Project Management Tool

Every action first has a plan. Depending on the complexity of the plan, certain tools may be needed to store and organize data, keep tasks on track, and evaluate effectiveness. One such management tool is the Gantt chart. This tool was developed by Henry Gantt to serve as a detailed timeline which, if followed, could help ensure tasks remained on track (Zaccagnini & Pechacek, 2021). See Figure 1.

Figure 1

Gantt Chart



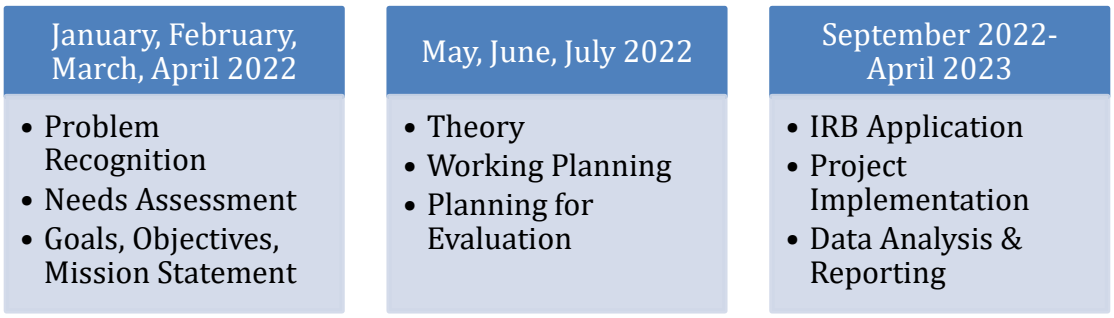
Timeline

A timeline serves as a tool to measure the components of a project. It can also be a way to visually prepare for what has occurred and what is to come. By using a work

breakdown structure, the work needing to be completed can be easily identified (Zaccagnini & Pechacek, 2021). Figure 2

Figure 2

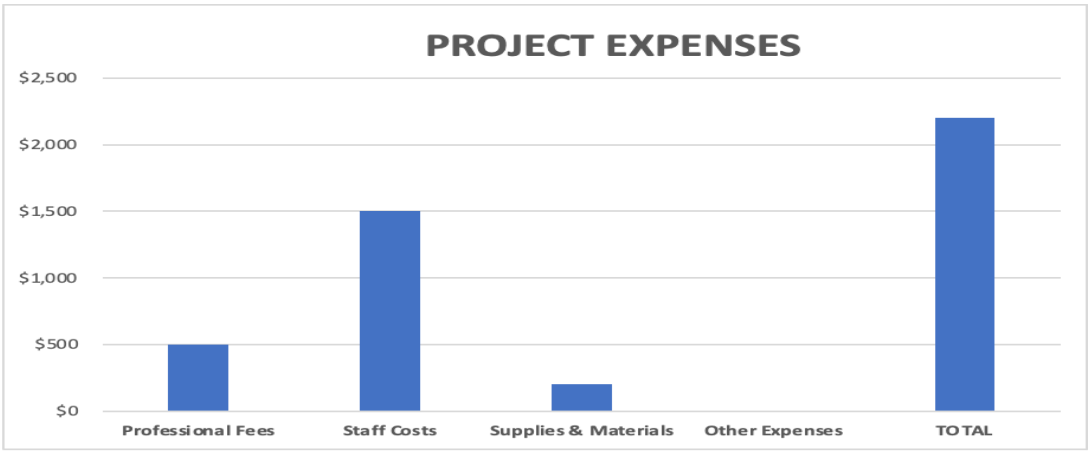
Timeline



Budget

Figure 3

Budget



Evaluation Plan

An evaluation plan is needed for any project that has objectives it is trying to meet. There are many methods that may be used but should be chosen based on the best fit for the project. Zaccagnini and Pechacek (2021) noted regardless of the tool used to

collect project data, it should be both reliable and valid. For this project the plan, do, study, act (PDSA) model was utilized:

- Plan: An educational session was developed to educate the cardiac care unit (CCU), registered nurses (RN) on defibrillator usage with hands-on instruction. Registered nurses on the target unit voiced concerns about the lack of continual education on defibrillator usage and requested more educational opportunities.
- Do: The project leader developed education related to defibrillator usage. Four educational classes were offered to night shift registered nurses (RN) on the target unit. Educational classes were mandatory; however, participation in the project surveys was voluntary.
- Study: Data collected for the project was obtained using a pretest and posttest design. The data was collected by utilizing a 5-question pre-intervention survey and a 5-question post-intervention survey. Questions assessed the subject's knowledge and confidence in utilizing the defibrillator. The data collected from the two surveys were reviewed and analyzed by using a t-test to determine the significance between the two survey responses before and after the educational intervention.
- Act: Project will be sustained by providing educational classes to the day shift registered nurses (RN) on the target unit and then expanded to other units within the target community. Education will be incorporated in new employee orientation and within the monthly and yearly checkoffs and competencies.

Threats and Barriers

Regardless of how well-planned a project is, there will always be situations that arise and threaten to derail progress. The project leader noted differences in the expected number of attendees versus actual attendees and should have clarified if contract nurses were to be included in the mandatory classes. There was also a change in nursing leadership throughout many units resulting in several educators that were unaware of the education sessions.

Implementation

The project leader hosted four educational sessions on how to utilize the defibrillator to cardiac care unit (CCU) registered nurses (RN) working night shift at the target community. The unit manager notified night shift RNs of the mandatory educational session via email. The nurses were required to attend one of the four educational sessions. Permission was obtained by the cardiac care educator to conduct the quality improvement project to increase knowledge and confidence among the RNs in the target community on the cardiac care unit regarding using a defibrillator. Internal Review Board (IRB) was obtained from the educational institution attended by the project leader; however, the target community did not require an IRB application to be completed to implement the quality improvement project. The educational sessions were conducted by the project leader on various days and times to accommodate the night shift nurse's schedules. The project leader helped facilitate the educational sessions, return demonstrations of how to use the defibrillator and answer questions at the end of the educational session. Each educational session lasted 90 minutes; 15 minutes to read the

informed consent and complete the pre-intervention survey, 60 minutes for the educational session, and 15 minutes post-intervention survey and questions.

Upon arrival to the educational session, all participants were given a printed copy of the informed consent and the pre-intervention survey. Participants were asked to place the pre-intervention survey in a sealed envelope after completion. The project leader left the room to allow participants time to complete the pre-intervention survey. Participants consent to participate in the project with the completion of the pre-intervention survey. At the conclusion of the educational session, participants were provided with a printed copy of the post-intervention survey. Participation in all survey completion was voluntary. Participants had the right to withdraw from surveys at any time without penalty. Participants had the right to refuse to answer any question(s) for any reason without penalty. If participants elect to not participate in the surveys, they could hand in a blank survey. The pre and post intervention surveys were placed by participants in a sealed envelope in the sight of the project leader. The box was locked outside of the educational room in the hallway for participants to place upon leaving the educational session. A total of 13 surveys were completed and analyzed at the completion of all four educational sessions.

Project Closure

At the completion of the educational session, the project leader assessed, analyzed, and reviewed the data collected from the pre and post surveys. A total of 13 survey results were documented in an Excel Spreadsheet and saved to a personal USB flash drive and kept with the project leader in a locked box. The USB flash drive and

questionnaires were given to the project leader's educational institution where it will be stored for 3 years and then destroyed.

Interpretation of Data

Data collected for the project was obtained using a pre-test and post-test design. A 5-question pre-intervention survey and a 5-question post-intervention survey were developed to assess the participants' knowledge and confidence in utilizing the defibrillator. The pre and post surveys were created by the project leader for the purpose of this project. The DNP project chair reviewed the surveys for face validity. A total of 13 surveys were completed. As a result of this project, nurses had an increase in knowledge and felt more comfortable with using a defibrillator during a code blue after the educational session and hands-on instruction. Below are the questions and results from the pre and post surveys:

1. **Before this educational session, how comfortable are you with using the Zoll?**

   Of the 13 surveys completed, 15.5% answered they were very comfortable, 61.5% answered they were somewhat comfortable, and 23% answered they were not comfortable at all. The same question was asked in the post survey, but the wording was changed from *before* to *after*. These results showed the teaching was effective with 92% stating they are now very comfortable with using the defibrillator. One of the participants (8%) responded they are somewhat comfortable using the defibrillator after the provided education.

2. **What color do you turn the dial to in order to monitor the patient's heart rate and rhythm?**

   For the pre-survey, 38% choose gray, which was the correct answer. This increased to 100% after the educational session.

3. **Before you can deliver a shock to the patient, you must first press which button to ready the defibrillator.**

   The results of the pre and post surveys went from 84.6% correct prior to the education to 100% correct after the educational session.

4. **Which team member is the most likely to find a patient in cardiac arrest?**

   The correct answer was nurse and 30.7% of the participants chose an incorrect answer for the pre-survey, whereas 100% chose correctly after the educational session.

5. **When performed correctly, code blue interventions increase a patient's chances of survival by how much?**

   When completing the pre-survey, 69.3% of respondents answered incorrectly. After completing the education, 100% of the participants answered correctly.

Conclusion

Nurses are noted within the literature to most likely be the first to notice a patient in cardiac arrest. The literature noted high quality cardiovascular pulmonary resuscitation (CPR) and early defibrillation are vital to the survival of individuals experiencing cardiac arrest. Registered nurses (RN) working on a cardiac care unit (CCU) expressed a lack of knowledge and confidence in utilizing a defibrillator. An educational session was developed to provide the target population with information and hands-on experience with using a defibrillator. A pre and post survey was conducted to evaluate the effects of the educational session on knowledge and confidence. An increase in knowledge and confidence was noted by the participants after the completion of the educational session. Continual education through monthly and yearly checkoffs and competencies is needed

to keep nurses up to date and comfortable with utilizing equipment which is vital within a code blue situation.

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