

Background

An estimated 290,000 in-hospital cardiac arrests (IHCA) occur each year in the United States with only approximately 25% of these patients surviving to discharge (Andersen et al., 2019; Høybye et al., 2021). While this survival rate has been steadily increasing since 2004 (American Heart Association [AHA], 2017), there are still identified areas for improvement, including education and skill reinforcement (Cheng et al., 2018).

Registered nurses (RNs) at Salinas Valley Health Medical Center are required to have a current Basic Life Support (BLS) certification. In certain specialties, RNs are required to have additional AHA certifications such as Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support (PALS). To earn these certifications, providers must demonstrate their ability to recognize and respond to emergencies such as cardiac arrest and/or respiratory arrest, which are situations often referred to as a *code blue* (aka code). The AHA requires renewal of these certifications every two years. While the renewal process demonstrates competence at the time of testing and skills demonstration, evidence suggests that biannual training alone is insufficient because skills and knowledge begin to wane within months of course completion (Smith et al., 2008).

Nurses who rarely perform resuscitation may feel unprepared or uncomfortable responding to cardiac or respiratory emergencies. One study performed at an acute care level 1 trauma center surveyed 184 medical-surgical nurses with current BLS (98%) and ACLS (66%) certifications and found that only 44% of them felt confident or comfortable performing resuscitation (O'Donoghue et al., 2015). Some hospitals have addressed this by regularly scheduling cardiac arrest simulations, also known as mock codes. These hospitals report increased nurse confidence in responding to cardiac arrest (Lee, 2021) as well as increased survival rates after IHCA (Josey et al., 2018). The AHA supports mock codes as a valuable way to provide supplementary education to reinforce resuscitation skills (Cheng et al., 2018).

In order to improve survival rates of IHCA, all aspects of resuscitation attempts should be analyzed including the role, education, and involvement of nurses (O'Donoghue et al., 2015). This quality improvement project was conducted to analyze nurse confidence levels and attitudes towards responding to code blues. The results will provide data to compare future educational and simulation experiences for effectiveness.

Methods

An online survey was created to measure nurse confidence and attitudes towards responding to codes. Questions were developed by one of the project leads (IH) based on his clinical experience leading codes and feedback from nurses.

The survey consisted of seven questions. Six questions focused on self-perceived confidence level in responding to a code blue, comfort level with certain aspects of code blue participation, and learning preferences for mock codes. Response options to these questions were either on a Likert scale, a single or multiple response option, or “yes” or “no.” One question was a free text option asking about desired additional training. Means were calculated for responses and presented as percentages. For the optional open response question, a list of responses was compiled and grouped by similar themes.

The survey link was sent to the directors and managers of each department requesting that they distribute it to their nurses. At the time, approximately 650 clinical nurses were employed. The survey was available for 59 days.

Results

Of the approximately 650 clinical nurses invited to take the survey, 122 nurses participated. Most nurses scored themselves as somewhat confident to confident with 45% of nurses reporting a confidence level of 5-7 on a Likert scale of 1 to 10 and 44% reporting a confidence level of 8-10. Eleven percent of nurses reported 1-4 representing low confidence (see Figure 1). Nurses reported the highest comfort levels with the roles of providing cardiopulmonary resuscitation (CPR), ventilations, or managing the Zoll® monitor (see Figure 2). They were the least comfortable with being the team lead, drug administration, and the Zoll monitor (see Figure 3). Most (95%) nurses were interested in hospital-wide mock codes. The desired frequency for mock codes varied, with 7% indicating they preferred biweekly, 46% monthly, 16% every two months, and 31% every three months. Most nurses (81%) preferred both day and night shifts.

Figure 1

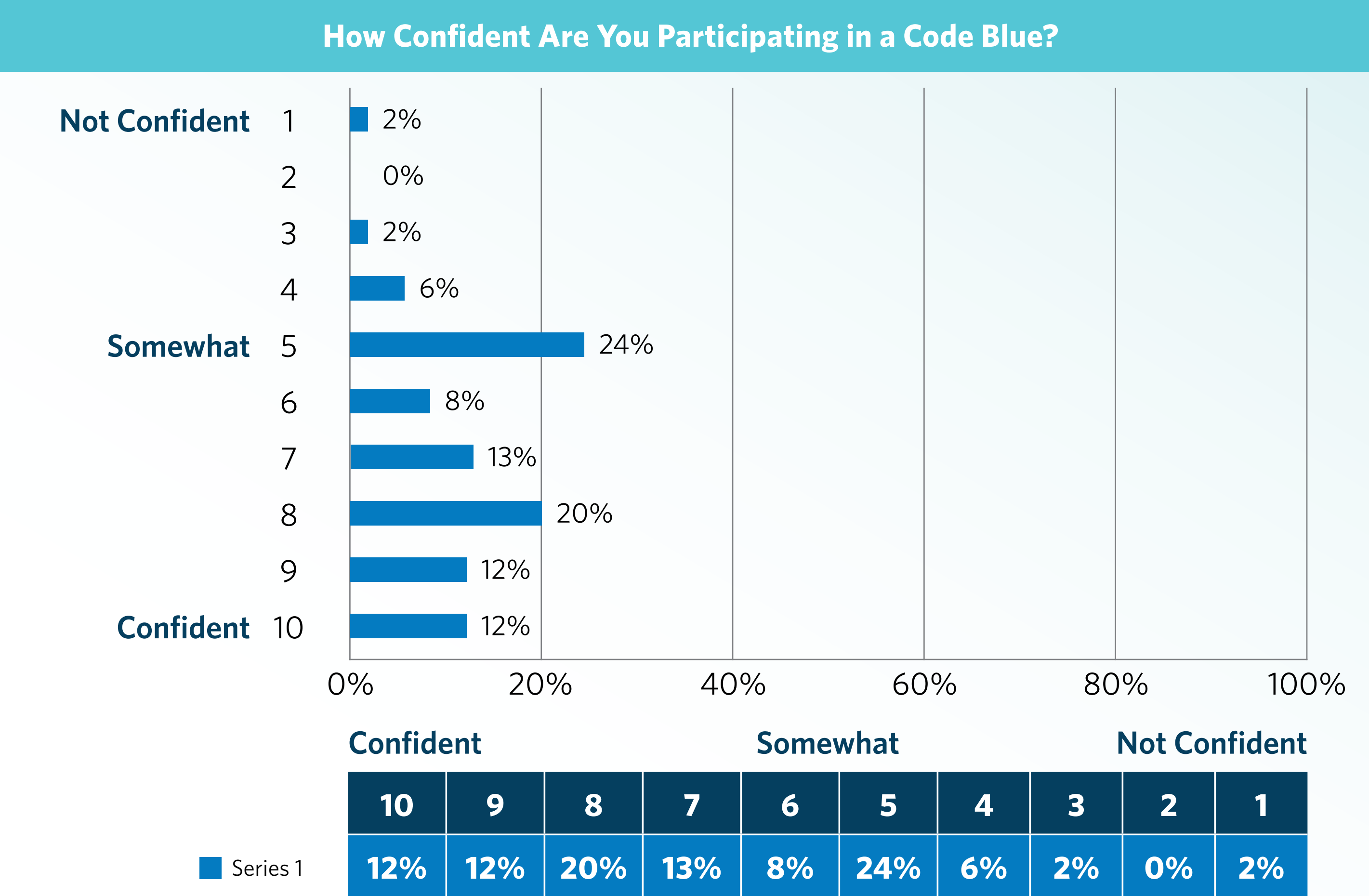


Figure 2

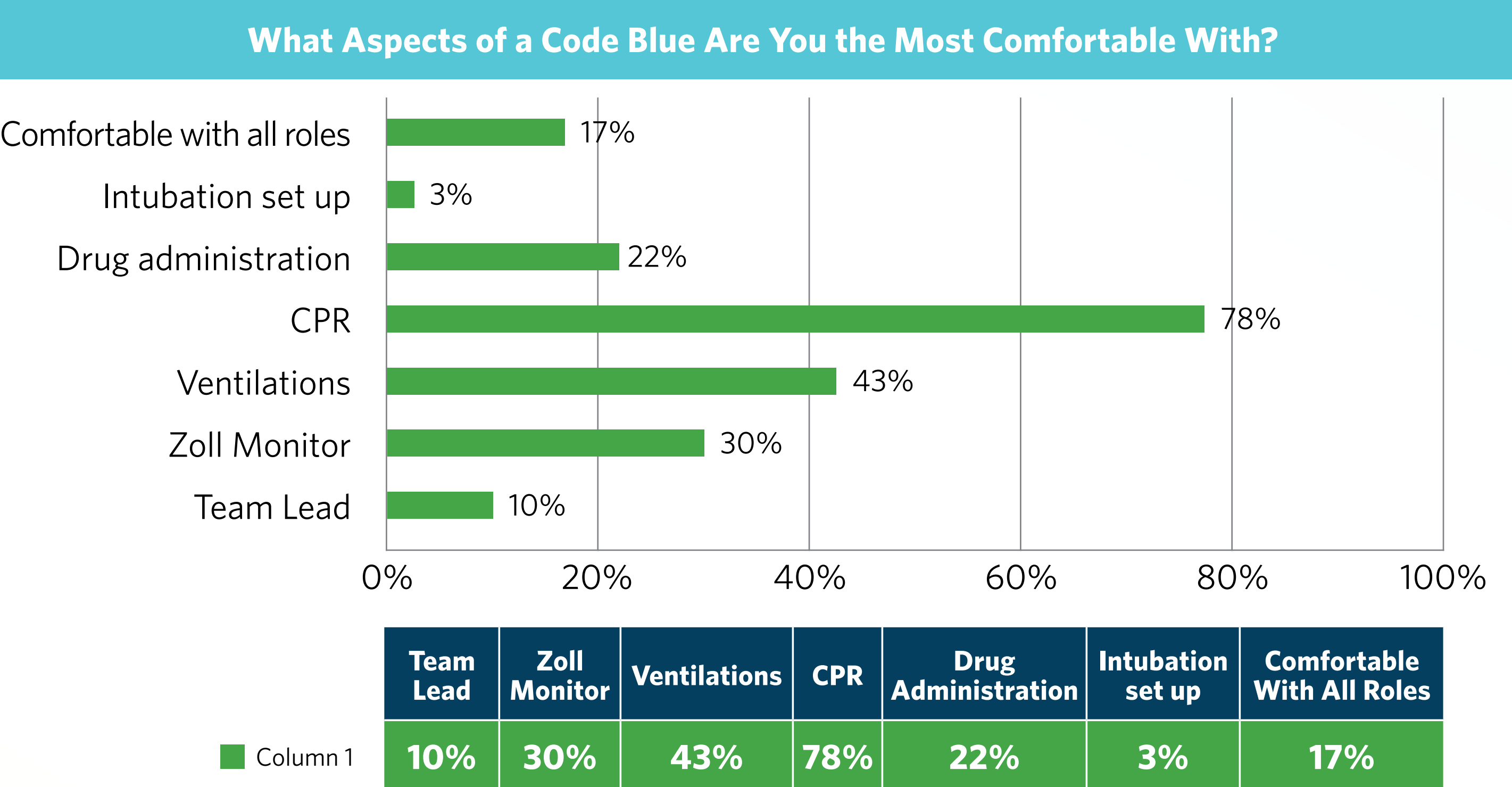
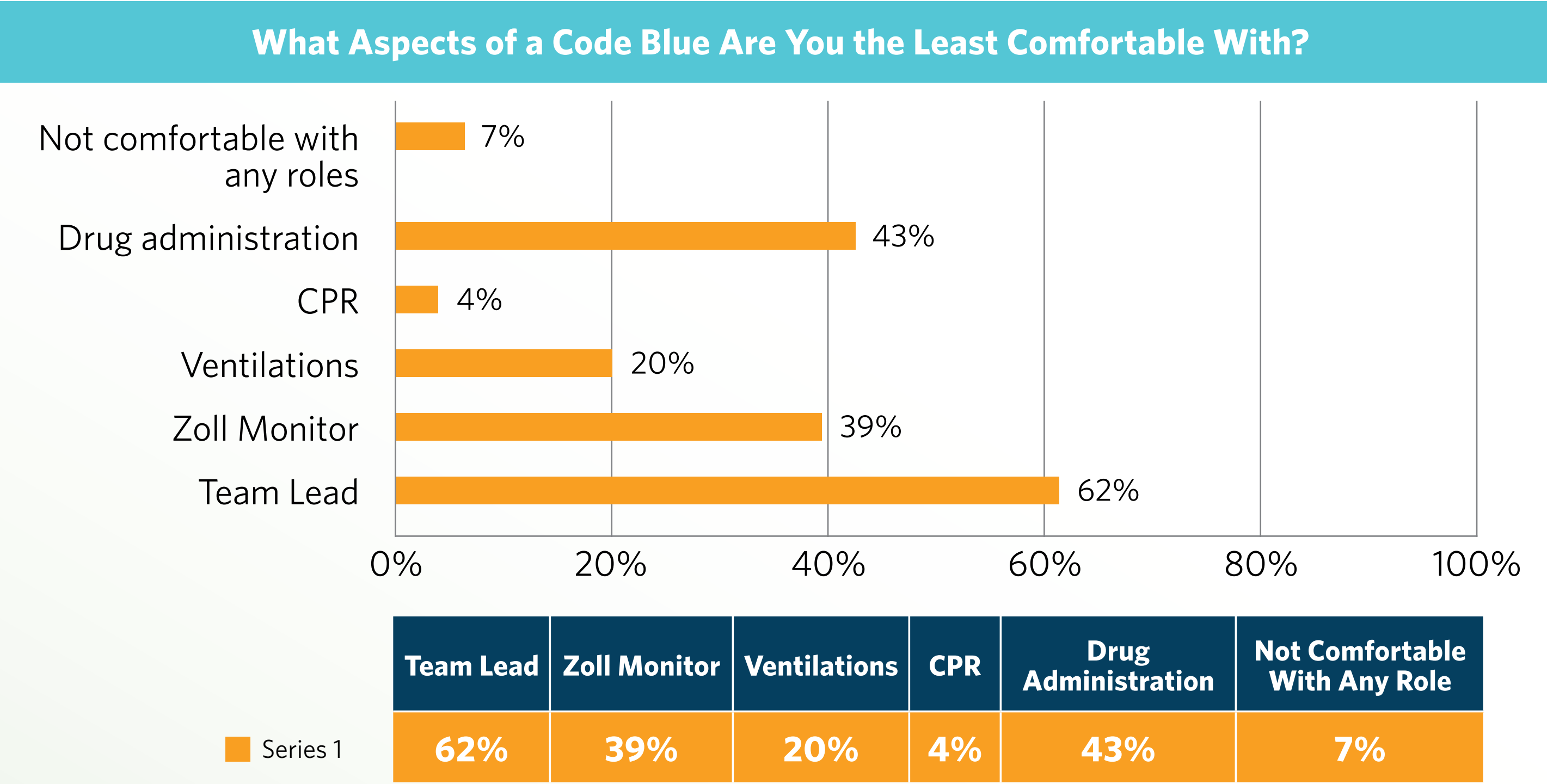


Figure 3



For the optional free text response, nurses requested additional training on the crash cart, code blue form documentation, incorporation of non-nursing staff into mock codes, medication indications, and equipment review. Additionally, suggestions were made for performing mock codes during annual skills camp and offering mock codes at the Education Department. See Table 1 for a summary of the main categories or themes.

Table 1

Open-Ended Comment Themes	
More crash cart review	Additional mock code sessions at Education Department
Documenting on the code blue form	Medication indications
More staff involvement on the day of mock codes	Mock codes during annual skills camp
Incorporating non-nursing staff into mock codes	More equipment review

Conclusions

While most nurses reported moderate to high confidence levels participating in code blues, nearly all nurses indicated that conducting mock codes would be helpful. This may suggest a lower level of confidence than reported and supports regularly scheduled mock codes. Insight was gathered by looking at which roles nurses reported feeling the most and least comfortable with. Respondents reported the highest comfort levels with physical, repetitive tasks such as compressions and ventilations but least comfortable with roles requiring complex decision making and critical thinking such as acting as team lead. This indicates a need for further education and practice in the critical thinking skills associated with responding to cardiac arrest which can inform the content for future trainings.

The results of this quality improvement project provide insight into the type of training to offer to nurses about code blues and will guide future code blue educational and simulation experiences.

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