



DePaul University  
Via Sapiientiae

---

Grace Peterson Nursing Research Colloquium

2019

---

Mar 19th, 10:00 AM

## Necessity of a Cardiopulmonary Resuscitation Refreshment Course Among Registered Nurses

Amber Tibbles

DePaul University, [amber.tibbles@gordon.edu](mailto:amber.tibbles@gordon.edu)

Ian Pfeiffer

DePaul University, [ipfeiffe21@gmail.com](mailto:ipfeiffe21@gmail.com)

Follow this and additional works at: <https://via.library.depaul.edu/nursing-colloquium>

 Part of the [Nursing Commons](#)

---

Tibbles, Amber and Pfeiffer, Ian, "Necessity of a Cardiopulmonary Resuscitation Refreshment Course Among Registered Nurses" (2018). *Grace Peterson Nursing Research Colloquium*. 1.  
<https://via.library.depaul.edu/nursing-colloquium/2018/winter/1>

This Event is brought to you for free and open access by the School of Nursing at Via Sapiientiae. It has been accepted for inclusion in Grace Peterson Nursing Research Colloquium by an authorized administrator of Via Sapiientiae. For more information, please contact [digitalservices@depaul.edu](mailto:digitalservices@depaul.edu).

Necessity of a Cardiopulmonary Resuscitation Refreshment Course Among Registered Nurses

Amber Tibbles & Ian Pfeiffer

Advisors: Young-Me Lee & Daniel Mead

DePaul University

March 2018

## **Chapter 1: Introduction**

### **Background and Significance**

According to the American Heart Association (AHA), regarding the frequency of cardiac arrest, “Every year in the U.S. more than 500,000 adults and children experience a cardiac arrest, and less than 15% survive,” (Meaney, et al., 2013, p.1). CPR is recommended to increase survival rate in those experiencing cardiac arrest or absent heartbeat (Meaney, et al., 2013).

When the heartbeat is in an emergent irregular state, the primary concern is the lack of continued blood circulation throughout the body’s vasculature. Blood is pumped throughout the body by the heart, delivering oxygen and nutrients to the body’s organs and tissues. Since the heart is not working when resuscitation is needed, the body’s organs and tissues are not receiving the oxygen and nutrients necessary for survival (AHA, 2017). CPR serves temporarily to manually pump the heart and thus facilitate circulation throughout the body, as severe and permanent damage can occur in a matter of minutes if the heart is not pumping blood throughout the body (AHA, 2012). Increasing the quality of CPR being performed during emergency situations can lead to higher chances for survival for the half-million Americans in need of resuscitation each year.

Furthermore, current regulations within the United States suggest that CPR recertification be completed every two years (ProTrainings, 2016), which leads to a major gap in CPR practice for certain nursing professionals not consistently practicing CPR, as a nurse might practice in a critical care setting, for example. A pre, post, and re-test (ten weeks after the post-test) study by Madden also showed a significant increase in nurses’ CPR performance after hands-on training (2006), thus suggesting that especially repetitious experience of CPR performance would increase one’s competency. The re-test results showed a significant decrease in competency, after only ten weeks. Therefore, two years without consistent training nor practice, one could

assume that nurses' CPR performance competency would decrease significantly and thus negatively affect patient outcomes.

Numerous recent studies have reported similar findings of a connection between the confidence level of the nurse and the nurse's performance of CPR on a patient (Herbers & Heaser, 2016; Källestedt, Berglund, Herlitz, Leppert, & Enlund, 2012). Herbers and Heaser (2016) found that nurses lacking confidence are more hesitant to respond during a resuscitation, and thus have a lesser chance for the highest potential and beneficial patient outcomes. A study by Källestedt et al. (2012) revealed that education and additional training positively affected nurses' attitudes towards performing CPR. An increase in positivity and confidence towards performing CPR in the case of resuscitation shows that additional training in CPR would be beneficial for nurses, especially as it has been shown to decrease their anxiety (Källestedt et al., 2012).

In addition to the confidence level of the nurse performing the CPR, the literature has consistently reported that the number of years of education and/or years of experience are associated with the nurse(s) performance of CPR on a patient (Ehlers & Rajeswaran, 2014). A study done in South Africa showed that healthcare providers who regularly perform CPR as is common to their unit in critical care, retained and showed higher competency levels regarding CPR than healthcare providers who do not regularly perform CPR as in non-critical care units (Govender, Rangiah, Ross, & Campbell, 2010, p. 462). Therefore, nurses who have more years of working experience, and thus more exposure to CPR, will have a higher percent of competency in performing CPR than nurses who have less experience. Furthermore, the study by Madden showed a significant increase in competency after the initial training as seen in the post-

test results (2006), demonstrating that education has a positive impact on nurses' skills competency.

### **Problem Statement**

Patient revival success is already established as determined by the efficacy and imperativeness in performing cardiopulmonary resuscitation (CPR) in someone who has undergone cardiac arrest or a potentially deadly arrhythmia. This fact has led to the recommendation that healthcare providers are Basic Life Support (BLS) certified, and thus CPR trained, by the American Heart Association (AHA). Nonetheless, from our review of the literature there are a limited number of studies assessing the comfort level of the RNs who will be practicing CPR in the event resuscitation is necessary.

### **Purpose of Study**

The purpose of this descriptive survey study is to 1) evaluate the level of comfort among Registered Nurses in their CPR skills, and 2) assess the need for supplemental education between periods of recertification.

### **Research Questions**

The following questions will be addressed:

1. What is the level of comfort to perform CPR in the event of patient resuscitation, irrespective of the setting among registered nurses?
2. What is the perceived need for a CPR refresher course(s) between periods of CPR recertification (24 months) among registered nurses?

### **Conceptual Framework**

The Health Belief Model which was reconstructed by Becker, Haefner, Maiman, Kirscht, & Drachman (1977) served as the framework for this study. The original model was formulated

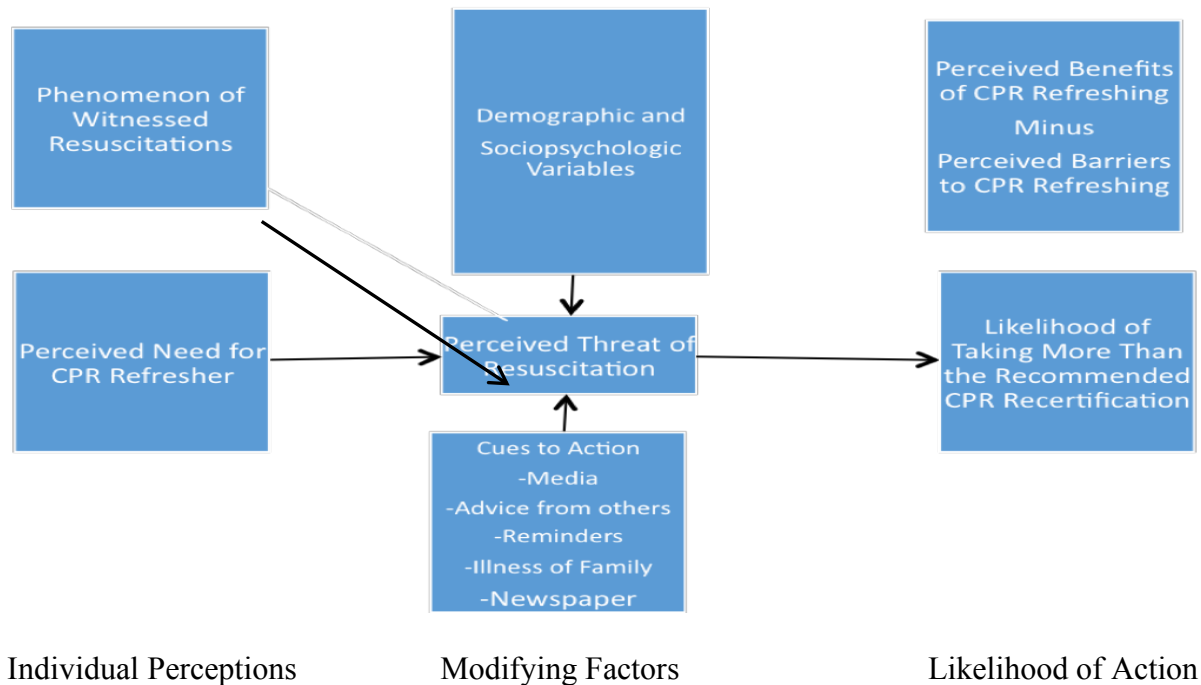
by social psychologists who worked for the United States Public Health Service in the 1950s, with the goal to increase preventive services used by the public. According to this model, the following concepts help describe health behavior: perceived susceptibility of the health problem, and the perceived severity, benefits, barriers, and cues to action. Applicable to this model, individual perceptions, modifying factors, and likelihood of action all may affect various diseases and disease processes. The client's believed probability of contracting a condition refers to his perceived susceptibility (McEwen & Wills, 2011). The client's understood threat of the disease helps formulation his perception of the disease, which forms a basis for this model.

Although there are many factors that influence a client's outlook on a disease and its potential threat to the client, this model condenses the primary variables within the "modifying factors" category: demographic, psychosocial, and structural variables. These variables affect the perceived susceptibility, seriousness, threat of the disease, and cues to action (McEwen et al., 2011). After the client has established his perceptions about the susceptibility, seriousness, and threat of the disease the next category addressed is the likelihood of action.

Apart from (perceived) barriers, the client's perceived benefits of preventive action are influenced by the client's demographic, psychosocial, and structural variables. Both the perceived benefits of preventive action and perceived threat of disease influence the likelihood of following preventive health recommendations (McEwen et al., 2011). This theoretical model can be extended to apply to healthcare professionals' (i.e. registered nurses') perceived threat of a resuscitation event which may be influenced by demographic, psychosocial, and structural variables in addition to the perceived need for a CPR refresher course.

This study applies a transformed version of the Health Belief Model to assess nurses' comfort level in performing CPR and to assess the need for a CPR refresher. The modified

model analyses registered nurses’ perceived need for a CPR refresher and the likelihood of refreshing CPR skills prior to the required recertification period. Furthermore, included in the model, is a specific addition to the individual perceptions category –the phenomenon of witnessed resuscitations. The following concepts will be explored and analyzed: phenomenon of witnessed resuscitations, perceived need for CPR refresher, perceived threat of resuscitation, perceived benefits and barriers to CPR refreshing, and the likelihood of taking more than the recommended CPR recertification education. The modified model is shown below in Figure 1.



**Figure 1.** The Modified Health Belief Model

## **Chapter 2: Review of Literature**

The review of literature was completed by obtaining material found on peer-review databases, such as the DePaul University Library databases online, PubMed, EBSCO and SAGE knowledge, and Science Direct. The focus of the literature searched was on CPR skills retention in the healthcare setting and in public settings.

### **Performance of CPR Among Registered Nurses**

Registered nurses are frequently the first responders to inpatient respiratory or cardiac arrest situations (Gordon & Buckley, 2009, p.495). It is very important registered nurses obtain the knowledge and skills to perform CPR accurately and efficiently. Poor knowledge and skill retention following cardiopulmonary resuscitation training for nursing and medical staff has been documented over the past 20 years in the literature (Cason & Baxley, 2011). A quasi-experimental study performed from January 2006 to January 2008, yielded a significant ( $P < 0.001$ ) depreciation in both CPR knowledge and psychomotor skills of nurses over two years, and even a decrease from the initial training ten weeks after (Mokhtari, Khademolv, Saghafinia, & Kalantar, 2012, p. 104). When looking at the findings of a study done in 2005, 28% of all reported CPR-D cases were below the recommended 90 to 100 compressions per minute (Abella, 2005). Furthermore, in the same 2005 study, 61% of the cases involved ventilations that were too fast for effective performance on the patient, and 37% of the cases proved that compressions provided to patients were too shallow (Abella, 2005). It is debatable if these inefficiencies in CPR performance are due to lack of sufficient hands-on practice, gap in CPR recertification periods, participant's ability to retain information, lack of variety in training methods, or simply a lack of knowledge. The literature review focuses on identifying whether varying CPR training



methods help RNs maintain the rudimentary knowledge to perform CPR efficiently and if time between recertification contributes to the deterioration of CPR skills.

### **Registered Nurses' Perspective on CPR Skills and Ability to Perform CPR**

The effectiveness of cardiopulmonary resuscitation on a patient can be affected by the registered nurse's individual beliefs, attitudes, skills, experience, and knowledge according to the theories of reasoned action and planned behavior (Dwyer & Williams, 2002). In a past study, 94% of registered nurses reported a communication gap between disciplines as a barrier to effective resuscitation in the emergency department (Hicks, Bandiera, & Denny, 2008). Evidence has shown improved proficiency in performing CPR in healthcare providers who have simulation training in addition to clinical experience (Gordon & Buckley, 2009, p.492). Evidence suggests a strong correlation in perceived inability to perform CPR with anxiety caused by resuscitation ( $P < 0.01$ ) (Niemi-Murola, Mäkinen, & Castren, 2007, p.259). Perceived level of confidence can influence the nurse's response time and potential hesitation to a resuscitation emergency which can impact chances of patient survival (Herbers & Heaser, 2016, p.394).

### **CPR Training Methods and Gap Between Certifications**

Literature in recent years has analyzed the efficacy of resuscitation training and found the common theme of skills and knowledge declining over time (Cason & Baxley, 2011). This was reproduced in the quasi-experimental study which showed a decrease of skills and knowledge after a mere ten weeks (Mokhtari et al., 2012). It became more apparent with every article that timing of CPR is everything, with patients receiving delayed CPR having worse outcomes. Cason and Baxley (2011) recommend resuscitation training every three to six months to prevent a noticeable decline of both skill and knowledge. Nurses have expressed the need for periodical refreshers between CPR certifications (Mokhtari et al., 2012) and have also expressed feelings

that the current education required is insufficient (Niemi-Murola et al., 2007, p.262). The best type of training used to keep RNs up-to-date on skills has been debated over the past decades. In a study done by Montgomery, Kardong-Edgren, Oermann, & Odom-Maryon (2012), students demonstrated better CPR skills performance, initially and over time, when they trained with the HeartCode Basic Life Support (BLS) compared to an instructor-led course. The HeartCode BLS machine is a computerized mannequin designed to evaluate rate, rhythm, compression depth, and other factors with the performer. The students practiced monthly with Voice Activated Mannequin (VAM) for a year. The researcher found monthly practice with the VAM improved CPR skill retention of nursing students and confidence to perform CPR accurately (Montgomery et al., 2012). The students gained confidence by receiving positive feedback which made them more interested in continuing monthly practice to maintain their skills (Montgomery et al., 2012). Another method used in recertification for healthcare providers is the BLS Anytime for Healthcare Providers kit which includes an online course, DVD, and inflatable mannequin. This learning tool promotes self-paced learning and allows healthcare professionals the flexible and convenient access for one year. The subjects using the kits, delivered a greater percentage of compressions of adequate depth with less interruptions than learners completing a traditional course (Cason & Baxley, 2011). Another study involving pediatric nurses found that high-frequency, brief bedside CPR refresher (“booster training”) produced higher skill acquisition rates in hospital BLS providers (Sutton et al., 2011, p. 146).

Many academic institutions and healthcare facilities use cardiac simulation to help students and healthcare professionals improve their knowledge in cardiopulmonary resuscitation in the setting of a relatively realistic environment, while also allowing them to become familiar with procedures and equipment. Post-simulation debriefing sessions aided in skill development

and retention (Gordon & Buckley, 2009, p.495). Another study found that additional training reduced anxiety in nurses performing CPR (Källestedt, Berglund, Herlitz, Leppert, & Enlund, 2012). The more practice healthcare professionals have in performing CPR, the less likely their skills and knowledge will deteriorate (Chee, 2014; Everett-Thomas, 2016). Providing opportunities for healthcare providers to refresh their CPR skills depends on the healthcare facilities in which they are employed. Healthcare facilities do not share a primary consensus regarding ongoing training or refresher courses for CPR. Sometimes the decision to implement continuing educational training can be rejected by a healthcare facility due to staffing problems and financial constraints (Issenberg & Scalese, 2008, p.34, 43). The decision of which type of training method used is decided by the facilities themselves, if they decide to implement ongoing CPR training for their staff. Some RNs may choose to independently refresh their CPR skills however, not much is known about what methods nurses use to refresh skills between recertification periods.

### **Summary**

Nurses proficiency in performing CPR is essential for the greatest chance of patient survival in cases requiring resuscitation, especially as nurses are often the first responders during CPR in the healthcare setting. Over the past couple of decades, healthcare professionals who do not routinely perform CPR have poor knowledge and skill retention following CPR training (Cason & Baxley, 2011). An abundance of literature shows skills decline over time. The RNs' main concern is a lack of CPR training available before the recertification period (Everett-Thomas, 2016). Stress, attitude, experience, and knowledge can also affect RNs' ability to perform CPR. Staff education is an essential part of the chain of prevention to assist hospitals in structuring their care processes to prevent and detect, patient deterioration and cardiac arrest

(Smith, 2010). Different CPR training approaches are being used to keep RNs updated. Some facilities are using VAM, self-paced learning kits, and CPR simulation to keep skills refreshed. Some facilities cannot implement these training programs due to lack of funds and proper staffing. Facilities have debated if continuous CPR training prevents deterioration of skills, which may be a contributing factor if facilities decide to implement continuous CPR training. Non-properly trained RNs will have less efficacy in performing CPR, or even neglect to perform regardless of the situation, and thereby contribute to negative patient outcomes. Without the implementation of CPR refresher courses between recertification periods for RNs, health care facilities may continue to put their patients at risk. Many RNs may not feel competent and comfortable enough to successfully perform CPR in a cardiac arrest situation.

### **Chapter 3: Methods**

#### **Design**

The quantitative descriptive survey design was used to determine the need for a CPR refresher course to increase RN's level of comfort performing CPR during the two-year gap between CPR license recertification. The data gathered from the main questions of this study (Question 1. "What is the level of comfort to perform CPR in the event of a patient resuscitation, irrespective of the setting, among registered nurses?" and Question 2. "What is the perceived need for a CPR refresher course(s) between periods of CPR recertification among registered nurses?") were used to run Chi-Square analysis and basic frequency, and descriptive methodologies to analyze demographic variables, what skills needed to be refreshed, if the participant thinks a refresher course is needed, and the readiness to use skills in an emergency (comfort level).

#### **Sample Population and Size**

This study included a convenience sample utilizing a snowball (network) sampling method to recruit a target sample of 100 registered nurses. The sample included the following inclusion criteria: having an active registered nurse license, Basic Life Support (BLS) certification, currently employed in a healthcare setting, and currently providing patient care. The exclusionary criteria consisted of the following: working in a critical care/emergency setting, having current certification as an Advanced Practice Nurse, or having Advanced Cardiac Life Support (ACLS) certification. The purpose of this specific exclusionary criteria was to limit this study's results to nurses who do not use CPR on a regular basis.

### **Setting**

Once we obtained approval from the IRB, we proceeded to apply for permission from the forum moderator at AllNurses.com –which is an online grouping of forums (designed for past, present and future nurses) to post our online survey. Registration allowing access to this forum is required by the website. These forums are a source of information pertinent to the field of nursing and provide a concise location, for those in the profession or career path of nursing, where education, research, and news about the nursing profession may be easily accessed.

Following IRB approval, we posted a study recruitment statement on the “Academic Nursing Research Participation Requests” forum for registered nurses to participate, along with a link to the questionnaire which is posted on Qualtrics.com (Appendix A). An information sheet providing all the survey and study details appears for participants to read (Appendix B), before participants could access the survey. Following this prompt, the participants proceeded to the survey (Appendix C) where they took the survey at a place and time of their choosing.

### **Instrument**

After a review of literature, the investigators compiled data from other studies with familiar research to create the survey tool. Nursing experts were consulted within the nursing field to ensure the questionnaire relates to the study. A review of literature and dialogue with registered nurses permitted the researchers to create a sufficient and quantifiable survey tool.

The survey asks participants to complete the online questionnaire totaling five questions which were developed by the researchers. Prior to accessing the primary questionnaire (titled “Comfort Level Performing CPR”), participants were required to complete a screening survey comprised of five questions (titled “Population Screening”) which served as an exclusion/inclusion assessment permitting only the participants that are not rejected by the exclusion criteria, and yet also qualify for inclusion criteria, to participate in the main survey which serves as the basis for this research study. The “Population Screening” was used to describe the sample. The “Comfort Level Performing CPR” survey is comprised of questions about level of education, years’ experience working as a RN, and details about time and education between CPR recertification periods –all of which have yielded the important core data that has been used to measure registered nurses’ comfort level performing CPR. Lastly, there is an optional and set-apart survey (titled “Need Assessment of Refresher Course”) following the primary survey, which assesses participants’ desire to take a refresher course and the motivating factor to refresh their skills.

In addition to the researchers’ analysis used to design the questionnaire, two experts in the nursing field have verified the content validity and appropriateness of the questions used in the questionnaire. Completion of both the “Population Screening” and “Comfort Level Performing CPR” surveys took approximately 2-5 minutes. The third survey, “Need Assessment

of Refresher Course” took approximately one additional minute if the participant chose to partake.

### **Data Collection**

Allnurses.com has a rule regarding posting on the “Academic Nursing Research Participation Requests” forum, which states, “The purpose of this forum is to allow Academic Nursing Related Research request to be posted on allnurses.com. All New Threads in this forum must be approved by allnurses.com staff before they get posted publicly” (allnurses.com, n.d.). The moderator posted the research link on the forum which contained a link to Qualtrics.com where the participant completed the survey. The first form viewable to the participant was the information sheet. If the participant agreed to the information sheet and clicked “I agree”, they were then directed to the survey. It took on average between two to five minutes for participants to complete the survey. Data collected has been stored in password-protected computers owned by the researchers with access permitted solely to the researchers.

### **Data Analysis**

Data was downloaded from Qualtrics to SPSS Statistics 24. Survey data was described using descriptive statistics. Chi-square was used to determine an association between years of practice and education and level of comfort.

### **Protection of Human Subjects**

The Institutional Review Board (IRB) at DePaul University reviewed and approved this study on October 3, 2017 before data collection began, which was to comply with regulations and ensure the safety and protection of human subjects who volunteered for this study. An information posting with consent and an advertisement about the study was provided for participants prior to accessing the survey. The information sheet included the following topics:

purpose of the study, confidentiality, and contact information for the study if the participant had questions or concerns. Participants were made aware their participation was voluntary and they could withdraw at any time prior to completing the survey, without penalty. For the protection of human subject anonymity, IP addresses were not collected from the website. All electronic copies of the survey responses were stored on a password encrypted hard drive on one computer. All copies of the survey responses were kept in a secured room by the researcher and were only viewed by the researchers and faculty advisors. Once the study was complete, electronic and hard copies of the responses were destroyed.

## **Chapter 4: Results**

### **Description of the Population Sample**

Being currently a licensed Registered Nurse (RN), having current BLS certification, and working in a non-critical care healthcare setting made up the inclusionary requirements for the survey. The nature of the critical care setting would most often require a nurse to participate in CPR, which is the reason we chose participants who did not work in a critical care setting. The population distribution for workplace setting was as follows: OB/GYN 36.6%, Medical/Surgical 19.5%, Pediatrics 2.4%, Rehabilitation 2.4%, Progressive Care 2.4%, and 36.6% selected “Other.” Additional demographics included highest level of nursing education (frequencies: 26.8% Associate, 41.5% Bachelor’s, 31.7% Master’s) and number of years as a RN (frequencies: 0-2 years 19.5%, 2-5 years 14.5%, 5-10 years 17.1%, 10-20 years 24.4%, and >20 years 24.4%). This survey’s population consisted of n=41 participants meeting the inclusionary requirements. All resulted frequencies can be found in Table 1 (Exclusionary/Inclusionary) and Table 2 (Inclusionary).

### **Comfort Level Performing CPR**



A relationship between the participants' education level (Associate, Bachelor's, Master's) and level of comfort performing CPR was assessed using Crosstabulation to run the nonparametric Chi-square test in SPSS. We questioned whether or not the participants' level of education (e.g. participants with a higher educational level would say they were comfortable more than those at a lower educational level) would influence their comfort in performing CPR in the event of an emergency. According to Chi-square which resulted in  $p < 0.683$  (limitation: 3 cells (50%) have expected count  $< 5$ ; the minimum expected count is 1.07) which is not statistically significant. Due to the relatively small sample size ( $n=41$ ), we also ran the Fisher's Exact Test which resulted at  $p < 0.808$  and is not statistically significant.

Furthermore, we sought to evaluate a relationship between years of experience (survey question "How many years have you been a Registered Nurse?") and level of comfort, using Chi-square test. The resulted  $p < 0.104$  (limitation: 5 cells (50%) have expected count  $< 5$ ; the minimum expected count is 0.59) proved to be statistically insignificant, thus negating the hypothesized relationship (e.g. hypothesized more experienced nurses would select "No" in answer to their level of comfort in performing CPR). Again, due to the relatively small sample size we also ran the Fisher's Exact Test which resulted at  $p < 0.069$  and is not statistically significant.

### **Need Assessment**

A one-sample chi-square test was used to evaluate the potential need for a refresher course using data from the following question: "What is a major motivating factor leading you to want to refresh your CPR skills? (Select all that apply)," (where the sample consisted of only those who selected "Yes" ( $n=24$ ) to, "Do you want to take a refresher course to improve your comfort level?"). The calculated  $p$ -value  $< 0.001$  is statistically significant as  $p < 0.05$ .

A one-sample Kolmogorov-Smirnov (one-sample K-S test) goodness-of-fit test was used to analyze a relationship between those who desire a refresher course to improve their comfort level ( $n=24$ ) and how often (every  $x$ -variable number of months) they think a refresher course should be offered (continuous scaled data). The calculated  $p$ -value  $< 0.001$  is statistically significant ( $p < 0.05$ ) and results in rejecting the null hypothesis. The one-sample K-S test was used to assess the probability of a normal distribution. We also ran a Crosstabulation between the following two questions: “Would you be interested in taking a refresher course to improve your comfort level?” (“Yes”  $n=24$ , “No”  $n=14$ , Total  $n=38$ ) and “How often do you think CPR certification refreshers should be offered?” (Total  $n=38$ ). The Pearson Chi-square value was significant at  $p < 0.023$  and the Fisher’s Exact Test was also statistically significant at  $p < 0.017$ .

### **Discussion**

Our question regarding level of comfort did not result as hypothesized, as 90% of participants said they would feel comfortable performing CPR, and only 10% selected they would not feel comfortable. About two-thirds of participants (63%) answered “Yes” to the need assessment question regarding wanting to take a refresher course to improve their comfort level.

Even though the majority of participants (only non-critical care) said they would be comfortable performing CPR in an emergency, over half (63%) expressed a want to take a refresher course to improve their comfort level. A validated tool of measurement, or possibly a scale, would provide more detailed and accurate data concerning level of comfort. Then perhaps a more valid conclusion could be made on whether their level of comfort (subjective) properly relates to their quality of performance (objective), or if there are additional factors influencing the self-perception of one’s comfort.

There might be a relationship related to self-perception, as seen by a 37.2% selection of having “Lack of practice” as a major motivating factor for wanting an additional refresher course to help further improve their comfort. The two next most selected factors included: “Drive to become proficient” (30.2%) and “Experience with witnessing/participating in cardiac arrest situations” (18.6%). Only 4.7% selected “Unit/Institution requirement” and 2.3% selected “Lack of knowledge” as their motivating factor, so perhaps a refresher course would provide the greatest impact by providing opportunities for nurses to refine their hands-on CPR skills.

Although a reported 36.8% reported not wanting a refresher course to improve their comfort, only 13.2% answered “Never” for the question “How often do you think CPR certification refreshers should be offered?”. The two highest ranking answers were “Every 6 months” (34.2%) and “Every 12 months” (42.1%). Thus 76.3% express a need for a refresher course at least twice as often as it is currently required. Our data also concluded that 22% of participants currently refresh their skills during periods of recertification, while the majority (78%) do not. If done again, it might be interesting to see if there is a relationship between demographics/access to those who do refresh their skills compared to those who do not.

### **Nursing Implications**

Among non-critical care nurses, there is a desire to improve comfort in performing CPR. The most beneficial way is by offering a hands-on based course, as many registered nurses feel they have sufficient CPR knowledge/education but are lacking practice. Furthermore, there was found to be no statistically significant relationship between levels of education/type of degree. Lastly, there was no statistically significant relationship between years of practice as a nurse and their comfort level. This may be that nurses tend to find a specialty (e.g. OB/GYN, Med/Surg, etc.) and stay where they are not confronted routinely with cardiac arrest situations. The results

indicate that the most beneficial frequency would be somewhere between every six to twelve months.

### **Limitations**

Limitations of this study include a convenience sample and the self-report methodology in a cross-sectional survey design. A substantial limitation was the small sample size (n=41) which was due to the inclusionary and exclusionary criteria used in this study. The original number of research study participants totaled ninety-seven (n=97), however, the targeted population that met all of the inclusionary criteria equaled forty-one (n=41). The survey questionnaire would end instantly at the point a participant met any part of the exclusionary criteria, because of our study design made using Qualtrics (a website you can design your survey, set the limitations, and collect data with personal information kept anonymous). A higher sample size of at least 100 would have provided more data and different results.

We understand that this study could be used as a pilot for further research on this topic. If done in the future, it would be better to redefine and broaden inclusionary criteria allowing for less participants to be excluded from the study. Assessing the need for more frequent refresher courses would be possible by including all nurses, including those in critical care, and adding additional demographic questions that we could use to further analyze the results. By excluding critical care nurses, we also reduced the available data with questions regarding comfort in performing CPR as well as assessing the need for more frequent refresher classes. Thus, this can serve as an example of where to revise and analyze to attain the best survey design that would collect the greatest amount of data pertaining to our study's goal.

The limited data was problematic, especially as noted in the third survey (e.g. “Select all that apply” questions) due to missing data. If redone, we would allow options such as “None of the above apply,” to perhaps help account for some of the missing data.

Another limitation of our survey questions was that we did not use a previously validated tool of measurement or factor analysis to take out questions. Furthermore, the questions could be reformatted/reframed and be more specific, to help answer the particular goal of the study.

Our data collection methods included the snowball network sampling and a posting on AllNurses.com (both preapproved by the IRB and AllNurses.com). It may have been a limitation not to have posted on Facebook or other social media sites to help bring awareness to our survey/study. If done again, we would have the survey opened for a longer period of time and would submit an application to the IRB for Facebook or other social media sites to help attain a greater number of survey participants.

## **Conclusion**

This study found that most nurses express they would be comfortable performing CPR in an emergency setting, yet over half expressed a desire to take a refresher course between periods of recertification. The most beneficial way to improve comfort level, pertaining to this quantitative survey, is to offer a refresher course with hands-on practice opportunity. Key limitations in this study were the small sample size (n=41) (in part due to limited amount of time to collect data), and question structure and content (formatting, valid tool of measurement, exclusionary criteria). Due to the aforementioned limitations, this study’s highest form of utility to nursing research would be its use as a pilot study from which to modify, re-collect data, analyze and further refine.

**Table 1 Exclusionary/Inclusionary Frequencies**

<b>Variables</b>	<b>Categories</b>	<b>Frequency (n=__)</b>	<b>Percent % Excluded (starting with n=93)</b>
<b>Are you currently a licensed Registered Nurse</b>	Yes**	90**	3.2%
	No	3	
<b>Are you an Advanced Practice Nurse (e.g. have earned a Doctorate degree or practice as a Nurse Practitioner)</b>	Yes	15	16.7%
	No**	75**	
<b>Do you work in a critical care healthcare setting (E.g. Critical Care, ICU, Emergency Department, etc.)</b>	Yes	18	24%
	No**	57**	
<b>Are you currently BLS certified</b>	Yes**	48**	15.8%
	No	9	
<b>Are you ACLS or PALS certified</b>	Yes	7	14.6%
	No	41**	
<b>Total Exclusionary</b>		56	57.7%
<b>Total Inclusionary</b>	ALL Inclusionary	41	

\*Total responses n=97, n=97 – n=4 unfinished surveys (excluded) → n=93, then see table above for the remaining breakdown

\*\*Inclusionary criteria

**Table 2 Frequencies**

<b>Variables</b>	<b>Categories</b>	<b>Frequency</b>	<b>Percent %</b>
<b>Workplace Setting</b>	OB/GYN	15	36.6%
	Med/Surg	8	19.5%
	Peds	1	2.4%
	Rehab	1	2.4%
	Progressive Care	1	2.4%
	Other	15	36.6%
<b>Highest Level of Nursing Education</b>	Associate	11	26.8%
	Bachelor	17	41.5%
	Master	13	31.7%
<b>Years as a Registered Nurse</b>	0-2	8	19.5%
	2-5	6	14.5%
	5-10	7	17.1%
	10-20	10	24.4%
	More than 20	10	24.4%
<b>How many Months until your CPR Recertification is Due</b>	Less than 3 months	7	17.1%
	3-6 months	7	17.1%
	6-12 months	12	29.3%
	12-24 months	15	36.6%
<b>Refresh CPR Skills between Recertification</b>	Yes	9	22%
	No	32	78%
<b>In an Emergency, would you Feel Comfortable Performing CPR</b>	Yes	37	90.2%
	No	4	9.8%
<b>Interest in a Refresher Course to Improve Comfort Level</b>	Yes	24	63.2%
	No	14	36.8%
<b>Major Motivating Factor Leading to Want to Refresh CPR Skills (Select all that applies)</b>	Experience with witnessing / participation in cardiac arrest situations	8	18.6%
	Drive to become proficient	13	30.23%
	Unit/Institution requirement	2	4.65%
	Lack of practice	16	37.21%
	Lack of knowledge	1	2.33%
	Other	3	6.98%
<b>How Often do you think CPR Certification Refreshers should be Offered</b>	Never	5	13.2%
	Every 1-2 months	1	2.6%
	Every 3-4 months	3	7.9%
	Every 6 months	13	34.2%
	Every 12 months	16	42.1%

### References

- Abella, B. S., Alvarado, J. P., Myklebust, H., Edelson, D.P., Barry, A., & O'Hearn, N., (2005). Quality of cardiopulmonary resuscitation during in-hospital cardiac arrest. *JAMA*, 293(3), 305-310. doi:10.1001/jama.293.3.305.
- AllNurses.com. (n.d.). Academic Nursing Research Participation Requests. Retrieved from website, 2013, from <http://allnurses.com/academic-nursing-research/>
- American Heart Association. (May 8, 2017). What is Heart Failure? Retrieved May 31, 2017, from [http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure\\_UCM\\_002044\\_Article.jsp#.WS5FIVK-JE5](http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/What-is-Heart-Failure_UCM_002044_Article.jsp#.WS5FIVK-JE5).
- American Heart Association. (2012). Timing is Everything. *Chain of Survival*. Retrieved from website, from [http://www.chainofsurvival.com/cos/Timing\\_detail.asp](http://www.chainofsurvival.com/cos/Timing_detail.asp).
- Becker, M. H., Haefner, D.P., Maiman, L.A., Kirscht, J.P., & Drachman, R.H. (December 1977). The Health Belief Model and Prediction of Dietary Compliance: A Field Experiment. *Journal of Health and Social Behavior*, 18, 348-366.
- Cason, C. L., & Baxley, S. M. (2011). Learning CPR with the BLS Anytime for Healthcare Providers Kit. *Clinical Simulation in Nursing*, 7, 237-243.
- Chee, J. (January 01, 2014). Clinical simulation using deliberate practice in nursing education: a Wilsonian concept analysis. *Nurse Education in Practice*, 14, 3, 247-52.
- Dwyer, T., & Williams, L. (2002). Nurses' Behaviour Regarding CPR and the Theories of Reasoned Action and Planned Behaviour Resuscitation, 54(2), 115 – 123



- Ehlers, V.J. & Rajeswaran, L., 2014, 'Cardiopulmonary resuscitation knowledge and skills of registered nurses in Botswana', *Curationis* 37(1), Art. #1259, 7 pages. <http://dx.doi.org/10.4102/curationis.v37i1.1259>
- Everett-Thomas, R., Yero-Aguayo, M., Valdes, B., Valdes, G., Shekhter, I., Rosen, L. F., & Birnbach, D. J. (July 01, 2016). An assessment of CPR skills using simulation: Are first responders prepared to save lives?. *Nurse Education in Practice*, 19, 58-62.
- Gordon, C. J., & Buckley, T. (January 01, 2009). The effect of high-fidelity simulation training on medical-surgical graduate nurses' perceived ability to respond to patient clinical emergencies. *Journal of Continuing Education in Nursing*, 40, 11, 491-8
- Govender, K., Rangiah, C., Ross, A., & Campbell, L. (September 01, 2010). Retention of knowledge of and skills in cardiopulmonary resuscitation among healthcare providers after training: original research. *South African Family Practice*, 52, 5, 459-462.
- Herbers, M. D., & Heaser, J. A. (September 01, 2016). Implementing an in Situ Mock Code Quality Improvement Program. *American Journal of Critical Care*, 25, 5, 393-399
- Hicks, C. M., Bandiera, G. W., & Denny, C. J. (2008). Building a Simulation-Based Crisis Resource Management Course for Emergency Medicine. Results from an Interdisciplinary Needs Assessment Survey. *Academic Emergency Medicine*, 15 (11), 1136 – 1143.
- Issenberg, S. B., & Scalese, R. J. (January 01, 2008). Simulation in Health Care Education. *Perspectives in Biology and Medicine*, 51, 1, 31-46.
- Källestedt, M.L., Berglund, A., Herlitz, J., Leppert, J., & Enlund M.. (April 01, 2012). The impact of CPR and AED training on healthcare professionals' self-perceived attitudes to

- performing resuscitation. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 20, 1, 26.
- Madden, C. (January 01, 2006). Undergraduate nursing students' acquisition and retention of CPR knowledge and skills. *Nurse Education Today*, 26, 3, 218-227.
- Meaney P.A., et al. (2013, June 25). *Top Ten Things to Know CPR Quality: Improving Cardiac Resuscitation Outcomes Both Inside and Outside the Hospital*[PDF, cpr.heart.org]. American Heart Association.
- Meaney, P. A., et al. (2013, July 22). Cardiopulmonary Resuscitation Quality: Improving Cardiac Resuscitation Outcomes Both Inside and Outside the Hospital: A Consensus Statement from the American Heart Association. *Circulation*, 128(4), 417-435.  
doi:10.1161/cir.0b013e31829d8654
- McEwen, M. & Wills, E.M. (2011). *Theoretical Basis for Nursing* (3<sup>rd</sup> ed.) 290-291. Philadelphia, PA: Lippincott Williams and Wilkins.
- Mokhtari, N. J., Khademoly, H. S. M., Saghafinia, M., & Kalantar, M. M. H. (February 01, 2012). CPR training for nurses: How often is it necessary?. *Iranian Red Crescent Medical Journal*, 14, 2, 103-106.
- Montgomery, C., Kardong-Edgren, S. E., Oermann, M. H., & Odom-Maryon, T. (2012). Student satisfaction and self-report of CPR competency: Heartcode BLS courses, instructor-led CPR courses, and monthly voice advisory manikin practice for CPR skill m. *International Journal of Nursing Education Scholarship*, 9(1).
- Niemi-Murola, L., Mäkinen, M., & Castren, M. (February 01, 2007). Medical and nursing students' attitudes toward cardiopulmonary resuscitation and current practice guidelines. *Resuscitation*, 72, 2, 257-263.

ProTrainings. (2016, November 16). ProCPR Article - Is 2 years Too Long Between

Certifications? Retrieved May 31, 2017, from <http://www.procpr.org/en/articles/two-years-too-long-between-certifications>

Smith, G. B. (2010). In-hospital Cardiac Arrest: Is it time for in-hospital chain of Prevention?

Resuscitation, 81(9), 1209 – 1211.

Sutton, R. M., Niles, D., Meaney, P. A., Aplenc, R., French, B., Abella, B. S., ... Nadkarni, V.

(January 01, 2011). Low-dose, high-frequency CPR training improves skill retention of in-hospital pediatric providers. *Pediatrics*, 128, 1, 145-51.

**Appendix A: Recruitment Posting**Recruitment Posting

To the members of Allnurses.com,

Hello, our names are Amber Tibbles and Ian Pfeiffer. We are both Master's degree in nursing candidates at DePaul University in Chicago, IL. We are conducting a research study as part of our program under the supervision of our research advisors, Dr. Young-Me Lee, PhD, RN (ylee23@depaul.edu) and Daniel R. Mead, MSN, APRN, NP-C ([dmead@depaul.edu](mailto:dmead@depaul.edu)) from the School of Nursing at DePaul University.

This quantitative descriptive survey is meant to assess the need for a CPR refresher course between the certification and recertification 24-month interval for registered nurses (RNs), while simultaneously analyzing factors that motivate RNs to refresh CPR skills between recertification periods. This research will also identify which CPR skills are lost between CPR recertification periods to assess what CPR training is needed to maintain CPR competency during those periods.

This study is open to anyone who is a registered nurse, has BLS certification, currently employed in a healthcare setting, currently in a job providing patient care and is not a critical or acute care nurse or a nurse that holds ACLS certification.

If you agree to participate in this study, completing the survey at Qualtrics.com will indicate your agreement to participate in the study. The online questionnaire consists of a "Population Screening" with five multiple choice questions and a "Comfort Level Performing CPR" section consisting of five multiple choice questions. The survey should take about 2-5 minutes to complete. Lastly, there is an optional and set-apart survey titled "Need Assessment of Refresher Course," following the primary survey which assesses participants' desire to take a refresher course and the motivating factor to refresh their skills. The "Need Assessment of Refresher Course" consists of three multiple choice questions that should take about one minute to complete.

There will be no identifying information collected so the questionnaire is completely anonymous. You can access the survey by clicking on our survey link here: "[http://depaul.qualtrics.com/jfe/form/SV\\_7W0x9PuF0isFGhn](http://depaul.qualtrics.com/jfe/form/SV_7W0x9PuF0isFGhn)". You can stop the survey at any time once you begin. At DePaul University, study results will be analyzed and discussed in a research paper. Once the article is completed, it will be available to you upon request.

Please find the link to the study below:

["http://depaul.qualtrics.com/jfe/form/SV\\_7W0x9PuF0isFGhn"](http://depaul.qualtrics.com/jfe/form/SV_7W0x9PuF0isFGhn)

If you have any questions, please feel free to contact Amber Tibbles at (312) 505-6730 or [atibbles@mail.depaul.edu](mailto:atibbles@mail.depaul.edu) or Ian Pfeiffer at (630) 338-7879 or [ipfeiffe@depaul.edu](mailto:ipfeiffe@depaul.edu). Thank you in advance for your time.

Sincerely,

Amber Tibbles, B.A.  
MSN Candidate, DePaul University  
Chicago, IL

Ian Pfeiffer, B.S.  
MSN Candidate, DePaul University  
Chicago, IL

## **Appendix B: Information Sheet for Participation in Research Study**

### **INFORMATION SHEET FOR PARTICIPATION IN RESEARCH STUDY** Refreshing Registered Nurses' Cardiopulmonary Resuscitation Skills

**Principal Investigators:** Amber Tibbles and Ian Pfeiffer, Master's of Science in Nursing Candidates, DePaul School of Nursing

**Institution:** DePaul University, Chicago, IL, USA

**Faculty Advisors:** Dr. Young-Me Lee, RN, PhD, and Daniel R. Mead, MSN, APRN, NP-C

We are conducting this research project because we are interested in the need to refresh Cardiopulmonary Resuscitation skills between periods of recertification for RNs working in the healthcare setting. We are asking you to be in this research study because we are trying to learn more about the need for a CPR refresher course between the certification and recertification 24-month interval for registered nurses (RNs) while simultaneously analyzing factors that motivate RNs to refresh CPR skills between recertification periods. This research will also identify which CPR skills are lost between CPR recertification periods to assess what CPR training is needed to maintain CPR competency during those periods. We are asking you to be in this research because you are a registered nurse in a healthcare setting, are BLS certified, and provide direct patient care. You cannot qualify if you are a critical care nurse, acute care nurse, or are ACLS certified.

If you agree to participate in this study, you will be directed to two surveys consisting of five multiple choice questions, and an optional survey with three questions following the completion of the primary survey which are located on Qualtrics.com. This questionnaire will not ask any identifiable personal data, only general demographic data, so your anonymity will remain intact throughout the process. Please answer every question as truthfully as possible. We truly value your opinion. If there are any questions you do not feel comfortable answering, please feel free to skip them. This questionnaire should take 2-5 minutes to complete. Once again, your anonymity will be protected. You have the right to withdraw your participation at any time. There will be no negative consequences if you choose to not participate or if you choose to withdraw your participation. You will be able to exit the questionnaire at any time. However, if you choose to submit your data, you will be unable to withdraw it due to the anonymity of the study.

If you have questions, concerns, or complaints about this study or you want to get additional information or provide input about this research, please contact one or more of the following contacts: Amber Tibbles at (312)505-6730 or [atibbles@mail.depaul.edu](mailto:atibbles@mail.depaul.edu); Ian Pfeiffer at (630)338-7879 or [ipfeiffe@depaul.edu](mailto:ipfeiffe@depaul.edu); Dr. Young-Me Lee at (773)325-4105 or [ylee23@depaul.edu](mailto:ylee23@depaul.edu); Daniel R. Mead at (773) 325-8648 or [dmead@depaul.edu](mailto:dmead@depaul.edu).

If you have questions about your rights as a research subject, you may contact Susan Loess-Perez, DePaul University's Director of Research Compliance, Office of Research Protections in the Office of Research Services at 312-362-7593 or by email at [sloesspe@depaul.edu](mailto:sloesspe@depaul.edu). Please do not hesitate to call if a question arises. You may also contact DePaul's Office of Research Protections if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.

***You may keep [or print] this information for your records.***

### Appendix C: Questionnaire

Link to active questionnaire: “[http://depaul.qualtrics.com/jfe/form/SV\\_7W0x9PuF0isFGhn](http://depaul.qualtrics.com/jfe/form/SV_7W0x9PuF0isFGhn)”

A copy of the survey in Word format and a PDF format as it is formatted online are included in separate documents. The survey in word format is as included below.

#### 1<sup>ST</sup> SURVEY: POPULATION SCREENING

1. Are you currently a licensed Registered Nurse?
  - a. Yes
  - b. No
  
2. Are you an Advanced Practice Nurse (e.g. have earned a Doctorate degree or practice as a Nurse Practitioner)?
  - a. Yes
  - b. No
  
3. Do you work in a critical care healthcare setting? (E.g. Critical Care, ICU, Emergency Department, etc.)
  - a. Yes
  - b. No

If No, in which setting do you work?

  - a. OB/GYN
  - b. Med/Surg
  - c. Peds
  - d. Rehab
  - e. Progressive Care
  - f. Other: \_\_\_\_\_
  
4. Are you currently BLS certified?
  - a. Yes
  - b. No
  
5. Are you ACLS or PALS certified?
  - a. Yes
  - b. No

#### 2<sup>ND</sup> SURVEY: COMFORT LEVEL PERFORMING CPR

1. In the event of a resuscitation, regardless of setting, would you feel comfortable performing CPR?
  - a. Yes
  - b. No
  
2. Highest level of nursing education:
  - a. Diploma
  - b. Associate
  - c. Bachelor
  - d. Master

3. How many years have you been a Registered Nurse?
  - a. 0-2
  - b. 2-5
  - c. 5-10
  - d. 10-20
  - e. More than 20
  
4. How many months do you have left until you must complete CPR recertification?
  - a. Less than 3 months
  - b. 3-6 months
  - c. 6-12 months
  - d. 12-24 months
  
5. Do you refresh your CPR skills during periods between recertification?
  - a. Yes
  - b. No

### **3<sup>RD</sup> SURVEY: NEED ASSESSMENT OF REFRESHER COURSE**

1. Do you want to take a refresher course to improve your comfort level?
  - a. Yes
  - b. No
  
2. What is a major motivating factor leading you to want to refresh your CPR skills? (Select all that apply)
  - a. Experience with witnessing/participation in cardiac arrest situation
  - b. Drive to become proficient
  - c. Unit/Institution requirement
  - d. Lack of practice
  - e. Lack of knowledge
  - f. Other: \_\_\_\_\_
  
3. How often do you think CPR certification refreshers should be offered?
  - c. Never
  - d. Every 1-2 months
  - e. Every 3-4 months
  - f. Every 6 months
  - g. Every 12 months