International Journal of Sustainability and Advanced Integrated Research
Volume 2, Issue 2 (April-June 2026) | ISSN: 3107-7854
DOI: https://doi.org/10.65339/ijsair.V2.I2.633

Assessing the Level of Competencies Among Emergency Room Nurses During Code Blue Events

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Publication history: Received: May 12, 2026; Revised: June 11, 2026; Accepted: June 17, 2026
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Abstract

This study assessed the competency levels of emergency room nurses during code blue events and determined whether demographic variables significantly influenced their perceived competencies. It was anchored on Patricia Benner's Novice to Expert Nursing Theory, Role Theory, Teamwork Theory, and the Input–Process–Output model, which framed competency and role clarity as outcomes of professional development, role understanding, and interprofessional collaboration. The study employed a descriptive correlational research design and was conducted in a private Level II hospital in Pasig City, Philippines. The respondents were registered nurses assigned to the emergency department who were directly involved in code blue responses. Data were gathered using a structured questionnaire that measured demographic profile and perceived competency during code blue events in terms of knowledge, skills, and attitude. Descriptive statistics summarized respondent characteristics and competency levels, while correlation analysis determined the relationship between demographic variables and competency domains. Findings showed that the emergency room nurse respondents were mostly young, largely college graduates, and predominantly early-career nurses, with most having attended relevant code blue training. The respondents demonstrated high perceived competency across knowledge, skills, and attitude domains. In the knowledge domain, they showed strong understanding of advanced cardiac life support principles, medication administration, post-resuscitation care, ethical considerations, and hospital code blue activation procedures, although rhythm recognition, infection control during resuscitation, and airway management required continued reinforcement. In the skills domain, nurses reported very high competence in performing chest compressions, ventilation, emergency medication administration, patient safety practices, defibrillator operation, and teamwork, while prompt activation and documentation accuracy were identified as areas for procedural improvement. In the attitude domain, respondents demonstrated professionalism, accountability, teamwork orientation, calmness, patient-centeredness, motivation for improvement, and reflective practice, although acceptance of constructive feedback was relatively lower. Correlation analysis revealed no significant relationship between demographic variables and perceived competency levels in knowledge, skills, and attitude. This indicates that competency during code blue events was not determined by age, gender, civil status, educational attainment, years of experience, or training attendance alone. The study concluded that emergency room nurses possess strong perceived competencies for code blue management, but targeted reinforcement is still needed in selected technical and procedural areas. The study recommended regular mock code simulations, structured post-event debriefing, standardized documentation and activation checklists, updated life support training, performance audits, and future objective or longitudinal assessments. The study aligns with SDG 3, Good Health and Well-Being, by supporting safer emergency response and patient care, and SDG 4, Quality Education, by emphasizing continuous professional development and simulation-based learning. Its sustainability impact is mainly public health, educational, institutional, and governance-related, as it supports safer hospital systems, stronger emergency preparedness, and continuous improvement in nursing practice.

Keywords: Advanced Cardiac Life Support, Attitude, Code Blue Events, Competency Enhancement Program, Emergency Room Nurses, Knowledge, Patient Safety, Resuscitation, Role Clarity, Skills

1. Introduction

The management of in-hospital cardiac arrest is one of the most critical responsibilities in emergency and critical care nursing. Code blue events require interdisciplinary coordination, rapid decision-making, and precise role execution, with nurses commonly initiating cardiopulmonary resuscitation, supporting airway management, preparing and administering medications, documenting interventions, and coordinating with the resuscitation team. Role clarity, or the degree to which team members understand their responsibilities and expectations, is essential because lack of clarity has been associated with errors, delays, and increased mortality in cardiac arrest situations. Globally, survival from in-hospital cardiac arrest remains a major concern, with survival to discharge ranging from 20% to 25% in high-income countries and as low as 10% in low- and middle-income settings (Cheng et al., 2021). Poor outcomes are linked to delayed CPR, inappropriate delegation, and confusion in resuscitation roles (Meaney et al., 2021). Evidence emphasizes that rapid recognition, clear

communication, and structured team roles improve survival and neurological outcomes (Hunt et al., 2020), yet role ambiguity persists even with international guidelines such as those of the AHA and ERC, particularly in resource-constrained hospitals.

Code blue is widely recognized as a hospital-wide emergency alert system requiring immediate multidisciplinary response (Cheng et al., 2021). Hospitals adopt standardized protocols to improve timeliness, accuracy, and patient safety (Merchant et al., 2020), making code blue systems an institutional commitment to rapid emergency response. The burden of in-hospital cardiac arrest is substantial, with global incidence estimated at 1.5 to 2.8 per 1,000 hospital admissions (Stankovic et al., 2021). Approximately 292,000 adults experience in-hospital cardiac arrest annually in the United States, with survival to discharge near 25% (Tsao et al., 2022; Girotra et al., 2020), while European survival rates range between 15% and 25% depending on hospital systems and rapid response protocols. In Asia, survival is often lower because of differences in infrastructure, training, and adherence to resuscitation guidelines (Bai et al., 2020; Wang et al., 2022). In the Philippines, limited published data exist, but tertiary hospital reports indicate that outcomes depend heavily on staff readiness and institutional protocols.

The chain of survival highlights early recognition, immediate CPR, timely defibrillation, and advanced life support as key determinants of survival (Merchant et al., 2020; Stankovic et al., 2021). Even one- to two-minute delays in CPR or defibrillation can reduce survival chances (Soar et al., 2021). High-quality CPR improves survival and neurological outcomes, while interruptions or poor technique worsen prognosis (Meaney et al., 2021). Effective communication and role clarity improve efficiency, reduce errors, and strengthen overall resuscitation performance (Couper et al., 2021). Hospitals with established rapid response teams and code blue protocols report lower mortality and better post-resuscitation care (Stankovic et al., 2021; Nolan et al., 2021), whereas inadequate staffing, limited equipment, and inconsistent training contribute to poorer outcomes (Soar et al., 2021). Survival with favorable neurological outcome remains the ultimate goal because neurological impairment can reduce quality of life and increase healthcare burden (Stankovic et al., 2021). Structured training, frequent mock codes, and systematic debriefing improve survival and neurological outcomes (Tsao et al., 2022).

The reviewed literature highlights several major themes: nurses' code blue responsibilities, role clarity, role ambiguity, teamwork, communication, leadership, and competency development. Nurses are central to code blue response because they are often continuously present at the bedside and are usually the first to recognize deterioration, initiate basic life support, and activate the code team (Soar et al., 2021; Merchant et al., 2020). Standard role assignments include chest compressions, airway management, IV access, medication administration, defibrillator operation, and documentation (Merchant et al., 2020). Nurses may maintain the airway, secure IV or intraosseous access, administer emergency medications, and record interventions, medication timing, rhythm checks, and outcomes. Regular BLS, ACLS, simulation, and certification programs strengthen nurses' preparedness and improve adherence to resuscitation standards (Greif et al., 2021). In some resource-limited settings, nurses also assume leadership functions during codes.

Role clarity is a core concept in emergency nursing practice. It refers to how clearly nurses understand their duties, responsibilities, reporting lines, and authorized decisions during high-acuity events. Clear role definitions reduce uncertainty and standardize action, while role ambiguity causes hesitation, duplication, and omission of critical tasks (Lee et al., 2022). Role clarity aligns with team-performance principles involving explicit task allocation, shared mental models, and anticipatory coordination (Couper et al., 2021; Cheskes et al., 2020). When code teams have predefined roles, they perform more efficiently, communicate more clearly, initiate CPR faster, shorten time to defibrillation, and adhere more consistently to guideline-based interventions (Hunt et al., 2020; Perkins et al., 2021; Meaney et al., 2021; Merchant et al., 2020). Role clarity also strengthens confidence, psychological safety, and closed-loop communication (Cheung et al., 2021).

The literature further shows that role ambiguity negatively affects resuscitation quality. Unclear task allocation can lead to interrupted chest compressions, delayed defibrillation, missed medication doses, duplicated tasks, and omitted interventions (Hunt et al., 2020). Teams without explicit role assignments experience task overlap and communication breakdowns (Cheskes et al., 2020). Poor leadership and assumed responsibilities fragment the resuscitation sequence (Couper et al., 2021; Cheung et al., 2021). Registry and quality-improvement data show that structured role allocation is associated with faster compressions and defibrillation, improved return of spontaneous circulation, and better survival outcomes (Girotra et al., 2020; Nolan et al., 2021). Conversely, role confusion contributes to preventable delays and adverse outcomes. Poor team processes and unclear role delineation are linked with lower odds of favorable neurological outcomes (Meaney et al., 2021; Soar et al., 2021).

Nurses' perceptions reveal that uncertainty commonly involves airway management, medication preparation, medication administration, defibrillator operation, and documentation. Overlapping expectations may delay IV access or force nurses to perform multiple tasks simultaneously, increasing cognitive load and error risk. Nurses value clear leadership,

preassigned roles, and structured debriefing because these reduce confusion and improve confidence (Cheung et al., 2021). Interventions such as role cards, structured briefings, and multidisciplinary simulation improve role confidence and resuscitation performance (Greif et al., 2021).

Teamwork, communication, and leadership are interdependent pillars of code blue success. Poor teamwork and communication are associated with delays, errors, and adverse events (Couper et al., 2021), while effective collaboration improves survival and ACLS adherence. Interprofessional simulation strengthens collaboration and patient outcomes (Leary et al., 2020; Mulla et al., 2021), helps team members understand one another's responsibilities (Hunziker et al., 2020), and promotes trust, reduced hierarchy, and faster return of spontaneous circulation. Closed-loop communication is recommended to reduce miscommunication (Merchant et al., 2020), while structured communication methods reduce errors and improve task completion (Cheng et al., 2021). Tools such as SBAR and checklists support accountability, whereas ineffective communication is associated with delayed defibrillation, medication errors, and inconsistent role fulfillment.

Leadership organizes code team performance through task delegation, reassessment, decision-making, and maintenance of teamwork and communication. Trained leaders improve ACLS compliance, accelerate interventions, and improve survival rates. Leadership training through high-fidelity simulation improves confidence, reduces cognitive overload, and strengthens crisis management (Couper et al., 2021). Psychological safety allows nurses to speak up and clarify concerns, and effective leadership with open communication can mitigate role ambiguity. Hospitals that invest in interprofessional training, communication protocols, and leadership development report better outcomes.

Training, simulation, and competency development are essential to sustaining role clarity and high-quality resuscitation. Mock codes rehearse technical skills and non-technical skills while refining role assignments in a low-risk environment, reducing time to first compression and defibrillation and improving ACLS adherence (Leary et al., 2020; Hunt et al., 2020). In-situ simulation reveals system threats such as equipment access, unit layout, and supply gaps. Structured debriefing consolidates learning and identifies persistent sources of role ambiguity (Cheng et al., 2021). Standardized programs such as BLS, ACLS, and multidisciplinary resuscitation courses improve technical performance, confidence, and team functioning (Greif et al., 2021; Perkins et al., 2021). Competency-based curricula using deliberate practice, recertification, checklist-based assessment, and validated metrics improve skill retention and role expectations. Role assignment training improves compression fraction and organized drug delivery (Perkins et al., 2021; Cheskes et al., 2020). High-fidelity simulation with expert debriefing is more effective than didactic-only methods for non-technical skills and team dynamics (Mulla et al., 2021). Progressive complexity, interprofessional participation, prebriefing, objective performance measures, and feedback support clinical transfer (Couper et al., 2021; Cheng et al., 2021). Low-cost, virtual, hybrid, and in-situ approaches may expand competency development in resource-limited settings (Mulla et al., 2021). Embedding training in quality-improvement systems supports sustainability.

The global literature shows that code blue outcomes vary according to hospital infrastructure, staffing, training, protocols, and access to equipment. High-resource settings may have specialized role distribution, while resource-limited settings often require nurses to multitask across airway, medication, documentation, and coordination functions. Workload pressures, staffing shortages, sudden redeployment, unfamiliar team members, hierarchical communication, and inconsistent protocols make role clarity difficult to sustain during emergencies (Couper et al., 2021). Resource limitations and inconsistent expectations across institutions also create uncertainty about what nurses are authorized to do during resuscitation. Organizational solutions include interprofessional simulation, prebriefing, checklists, role assignment briefings, leadership scripts, nurse-driven protocols, regular refreshers, harmonized protocols, protected training time, and resilient staffing models (Greif et al., 2021; Perkins et al., 2021).

In the Philippines, emergency room nurses are at the frontline of code blue response, but role ambiguity remains a concern. Local experiences suggest confusion about responsibility for medications, airway adjuncts, documentation, and other tasks during high-pressure resuscitation. Although training programs exist, reinforcement of role-specific competencies is inconsistent. Philippine literature remains limited, yet available local evidence indicates that code blue management is shaped by institutional protocols, ad hoc practices, workforce constraints, unclear expectations, competing duties, and interruptions. Interim resuscitation guidance during the COVID-19 pandemic reflected local adaptation of international guidance and the need for context-sensitive protocols (Philippine Heart Association, 2020). Comparable Asian middle-income settings show that delayed recognition, delayed defibrillation, limited equipment, and inconsistent team training contribute to poorer outcomes (Bai et al., 2020; Wang et al., 2022). Simulation and mock-code interventions improve confidence and team performance, but they must be adapted to local staffing, scheduling, and equipment realities (Hazwani et al., 2020; Leary et al., 2020; Mulla et al., 2021). Philippine-specific challenges include inconsistent role assignments, limited interprofessional simulation, limited debriefing, and variability in protocols for nurse-led actions (Philippine Heart Association, 2020).

This study is anchored on Benner's (1984) Novice to Expert Nursing Theory, Role Theory, Teamwork Theory, and the Input–Process–Output model. Benner's (1984) Novice to Expert Nursing Theory explains how nurses progressively acquire knowledge, skills, clinical judgment, and confidence through experience. In code blue situations, nurses' ability to respond effectively depends on technical competence and intuitive decision-making developed through clinical exposure. This framework is relevant in emergency and critical care settings because experience and clinical acumen support rapid role assumption and teamwork. Role Theory explains how individuals understand, enact, and internalize organizational roles. Clear role expectations strengthen performance, accountability, and coordination. In resuscitation, Role Theory supports the need for predefined nursing responsibilities such as initiating compressions, administering medications, documenting care, and assisting airway management. Role ambiguity has been linked to overlap, errors, and delays in patient care during high-stress events (Chang et al., 2021; Al Khalaileh & AlQudah, 2022).

Teamwork Theory, particularly the framework of effective team performance developed by Salas and colleagues, emphasizes the importance of communication, leadership, coordination, mutual support, and shared mental models among team members. In code blue situations, effective teamwork facilitates clear role execution, promotes closed-loop communication, and supports timely, leadership-guided interventions that contribute to efficient and coordinated patient care.. Teamwork is associated with resuscitation quality, faster defibrillation, and improved survival (Hunziker et al., 2020). Together, the three theories frame role clarity as a multidimensional construct shaped by clinical expertise, organizational role expectations, and interprofessional collaboration. The conceptual basis follows the Input–Process–Output model. The input includes emergency room nurses' demographic and professional characteristics, including age, gender, civil status, educational attainment, years of clinical experience, emergency department experience, and code blue training. The process involves assessment of competency levels during code blue events in terms of knowledge, skills, and attitude through structured questionnaires and statistical analysis. The output is a proposed competency enhancement program and recommendations to improve code blue preparedness and patient outcomes.

Although code blue events, resuscitation practices, and interprofessional teamwork have been widely studied, there remains a significant gap in understanding nurses' role clarity during code blue events, particularly in the emergency room setting. Existing studies often focus on clinical outcomes such as survival, response times, CPR, and defibrillation effectiveness (Soar et al., 2021; Hunziker et al., 2020), but fewer studies examine how clearly defined nursing roles contribute to those outcomes. Evidence shows that role ambiguity causes delays, duplication, and communication breakdowns that affect survival (Chang et al., 2021; Al Khalaileh & AlQudah, 2022), yet research remains concentrated in high-income settings with stronger simulation and training resources. Philippine-based research is limited despite local challenges such as resource limitations, variable protocols, and staffing shortages (Almazan & Albougami, 2022). International guidelines from the AHA and ERC provide standardized role assignments, but their real-world implementation may be inconsistent (Soar et al., 2021). Few empirical studies assess whether emergency room nurses perceive these role assignments as clear, realistic, and implementable under stressful conditions. While teamwork and communication have been studied broadly (Salas et al., 2020), the specific contribution of nursing role clarity to team efficiency, patient safety, survival outcomes, stress, confidence, and job satisfaction remains under-investigated. This study addresses these gaps by evaluating the competency levels of emergency room nurses during code blue events and examining the relationship between demographic characteristics and perceived competency. It focuses on knowledge, skills, and attitude and aims to generate evidence for a competency enhancement program that can improve code blue preparedness, role clarity, and patient safety.

This study aligns most directly with SDG 3 – Good Health and Well-Being because it seeks to improve emergency response, patient safety, survival outcomes, and quality of care during life-threatening in-hospital cardiac or respiratory arrest. By strengthening nurses' competency and role clarity during code blue events, the study contributes to safer and more effective healthcare delivery. The study also supports SDG 4 – Quality Education because it emphasizes competency development, simulation, mock code drills, structured training, continuing education, and evidence-based learning for emergency room nurses. The proposed competency enhancement program may guide professional development activities that improve knowledge, skills, attitudes, confidence, and teamwork. The study contributes to SDG 9 – Industry, Innovation and Infrastructure by supporting stronger hospital emergency response systems, structured code blue protocols, role assignment mechanisms, and institutional preparedness. It also relates to SDG 16 – Peace, Justice, and Strong Institutions because standardized role expectations, documentation, policy development, and accountable resuscitation systems strengthen hospital governance and patient safety. Lastly, it supports SDG 17 – Partnerships for the Goals because effective code blue response depends on interprofessional collaboration among nurses, physicians, respiratory therapists, pharmacists, hospital administrators, educators, and policymakers.

The study contributes to public health sustainability by promoting safer, faster, and more coordinated emergency care for patients experiencing cardiac or respiratory arrest. Improved role clarity may reduce delays and errors, support timely interventions, and strengthen survival-focused patient care. It also supports educational sustainability by identifying competency gaps and informing training programs, simulation activities, continuing education, and nursing curricula focused on code blue preparedness. The study contributes to institutional sustainability by helping hospital administrators

develop clearer policies, role assignments, support systems, and code blue protocols. It may also inform policy and governance sustainability by guiding standardized training requirements and national or institutional protocols for code blue management. In terms of workforce sustainability, the study may help nurses reduce stress, improve confidence, clarify responsibilities, and strengthen teamwork during high-pressure clinical events. Because code blue response is multidisciplinary, the findings may also benefit physicians, respiratory therapists, pharmacists, educators, policymakers, and future researchers by supporting more coordinated and evidence-based emergency care systems.

The study focuses on registered nurses assigned to the emergency department of a private Level II hospital in Pasig City who are directly involved in code blue resuscitation. It examines respondents' demographic characteristics, competency levels in knowledge, skills, and attitude, and the relationship between demographic profile and perceived competency during code blue events. The study uses a descriptive correlational design to examine associations without manipulating variables. Data collection was planned within September 2025 to December 2025, allowing time for survey administration, validation, and analysis. Although limited to one private hospital and based on self-reported measures, the study provides evidence on the importance of role clarity and competency development in emergency nursing practice.

2. Material and methods

2.1 Research Design

The study employed a descriptive correlational research design, which describes the current status of a phenomenon and examines relationships among variables without manipulation (Creswell, 2023). This design was appropriate because the study aimed to determine how emergency room nurses' demographic characteristics relate to their perceived level of role clarity during code blue events. It allowed the researcher to measure naturally occurring variables and identify associations and patterns within the target population (Polit & Beck, 2021; Creswell, 2023). This design enabled the researcher to assess nurses' demographic profiles, including age, gender, years of experience, educational attainment, and training, together with their perceptions of role clarity. Through standardized instruments and structured questionnaires, the study quantified nurses' experiences and examined how selected demographic factors may influence their understanding and execution of assigned responsibilities during high-pressure code blue situations. This approach was also ethical and practical because it did not require manipulation of variables in emergency healthcare settings where patient care cannot be altered for research purposes (Creswell, 2023; Chang et al., 2021). The descriptive correlational design also provided baseline data and actionable insights for hospital administrators and nursing leaders by identifying demographic or experience-related factors that may require targeted training or support. Previous healthcare studies have used this design to examine relationships among nurse characteristics, role clarity, and performance outcomes, supporting its relevance to the present study (Al Khalaileh & AlQudah, 2022).

2.2 Locale of the Study

The study was conducted in a private Level II hospital in Pasig City, Philippines, with a 100-bed capacity. The hospital has a fully operational emergency department equipped to manage medical and surgical emergencies, including in-hospital cardiac arrest cases requiring code blue response. The site was selected because emergency room nurses in this setting regularly participate in code blue events, making it an appropriate locale for assessing role clarity, responsibilities, and factors affecting nurses' performance during critical resuscitation situations.

2.3 Respondents of the Study

The respondents were registered nurses assigned to the emergency room of the selected hospital and directly involved in code blue responses. Their responsibilities include immediate life-saving interventions such as airway management, cardiopulmonary resuscitation, emergency medication administration, and documentation. The respondents were chosen because their direct exposure to code blue situations provided relevant firsthand perceptions regarding role clarity, team coordination, communication, and patient care during emergency resuscitation. Eligible respondents were registered nurses currently employed in the emergency department, with at least six months of clinical experience in the emergency room, direct participation in code blue events, and willingness to provide informed consent. Nurses on extended leave, nurses with administrative-only roles, and those without current practical exposure to code blue resuscitation were excluded.

2.4 Sample and Sampling Procedure

The study population consisted of registered nurses assigned to the emergency room of the selected private Level II hospital in Pasig City. Based on hospital records, the emergency room employed approximately 40 to 50 registered nurses who were involved in emergency case management, including code blue events. Purposive sampling was used to select participants because this non-probability technique allows the researcher to deliberately choose individuals who possess characteristics relevant to the study objectives (Creswell, 2023; Polit & Beck, 2021). In this study, the primary criterion was direct experience in code blue events within the emergency department. This sampling approach ensured that the

participants had meaningful exposure to resuscitation situations and could provide valid and relevant information about role clarity, team performance, and patient care during code blue events.

2.5 Research Instrumen

The study used a structured questionnaire composed of two parts. The first part gathered the demographic profile of the respondents, including age, gender, highest educational attainment, years of clinical experience in the emergency room, and professional training related to code blue management. These variables were included to provide background information that may influence nurses' perceptions of role clarity and performance during critical incidents. Collecting demographic data also allowed the identification of possible correlations between nurse characteristics and their experiences or challenges in code blue events (Polit & Beck, 2021). The second part measured the level of role clarity among emergency room nurses during code blue events. This section used a standardized tool adapted from published guidelines and validated questionnaires on code blue response and emergency nursing performance (Hunziker et al., 2020; Salas et al., 2020). The tool used a 4-point Likert scale with response options of 4 for Always, 3 for Often, 2 for Sometimes, and 1 for Never. It assessed nurses' understanding and execution of roles during code blue events, including assigned responsibilities, confidence in airway management, CPR, medication administration, documentation, knowledge of communication protocols and leadership hierarchy, awareness of contingency plans and emergency procedures, and participation in simulation-based training and mock code drills. Each dimension contained 10 items, allowing the instrument to capture detailed data on role clarity. The questionnaire was treated as a standardized instrument. A pilot test was conducted among a small group of emergency room nurses outside the study site to refine the tool and ensure its reliability and applicability before the main data collection.

2.6 Data Gathering Procedure

Data gathering was conducted systematically to ensure accuracy, reliability, and ethical compliance. The process began after approval was obtained from the hospital administration and the Institutional Ethics Review Board. Data collection was conducted from September 2025 to December 2025, allowing adequate time for coordination, administration, and follow-up. Formal permission was requested through letters submitted to the identified hospital and institution. After approval, the researcher coordinated with the emergency department nurse manager to identify eligible respondents based on the inclusion criteria. The selected emergency room nurses were then briefed on the purpose, objectives, and procedures of the study. During the briefing, they were informed about their rights, the voluntary nature of participation, and the confidentiality of their responses. Written informed consent was obtained before questionnaire administration. The standardized questionnaire was distributed either in paper-based or electronic format, depending on participant convenience and hospital policy. Respondents were given approximately 30 to 45 minutes to complete the instrument without interruption. The researcher was available to clarify questionnaire-related concerns without influencing the respondents' answers. Completed questionnaires were collected immediately to maintain data integrity, then coded and entered into a secured database for statistical analysis. Access to the data was limited to the researcher and designated research assistants. Follow-up reminders were provided to participants who were unable to submit the questionnaire on the scheduled day.

2.7 Data Analysis Techniques

The study used descriptive correlational statistical methods to analyze data on emergency room nurses' role clarity during code blue events. According to Creswell (2023), descriptive correlational research examines relationships between variables while describing the characteristics of a particular population. This approach allowed the researcher to summarize demographic and role clarity data while exploring associations between nurses' background characteristics and perceived role clarity. Descriptive statistics were used to present the respondents' demographic profile, including age, gender, educational attainment, years of clinical experience, and professional training related to code blue management. Frequency counts, percentages, means, and standard deviations were computed to provide a clear overview of participant characteristics. For role clarity, responses from the 4-point Likert scale were treated as interval data. Mean scores were computed for each dimension to determine the respondents' overall level of understanding and execution of assigned responsibilities during code blue events. Standard deviation was used to determine the variability of responses. The mean score interpretation was Very High for 3.26 to 4.00, High for 2.51 to 3.25, Low for 1.76 to 2.50, and Very Low for 1.00 to 1.75. Inferential statistics were used to examine the relationships between demographic variables and perceived role clarity. Pearson's correlation coefficient was used to determine the strength and direction of associations between continuous variables, such as years of clinical experience and role clarity scores. Statistical analyses were conducted using SPSS version 28 or higher, with the level of significance set at $p < 0.05$.

2.8 Ethical Considerations

Ethical considerations were observed to protect the rights, privacy, safety, and well-being of the participants. The study adhered to the principles of the Declaration of Helsinki, which emphasizes respect for individuals, beneficence, non-maleficence, and justice in human-subject research (World Medical Association, 2013). Before data collection, formal approval was secured from the hospital administration and the Institutional Ethics Review Board. Participants were informed about the purpose, objectives, procedures, potential risks, and benefits of the study. Written informed consent

was obtained, and participants were informed that their participation was voluntary and that they could withdraw at any time without negative consequences to their employment or professional standing. Confidentiality and anonymity were strictly maintained. Questionnaires did not include personal identifiers, and completed forms were coded using unique identification numbers. Data were stored securely and accessed only by the researcher and authorized research assistants. Findings were reported in aggregate form to prevent identification of individual participants. The study involved minimal risk because it only required nurses to answer survey questions about their perceptions and experiences. Possible emotional discomfort from recalling stressful code blue events was addressed by allowing participants to skip questions they were uncomfortable answering. Support resources, such as access to hospital counseling services, were made available if needed. Recruitment was conducted without coercion, and special care was taken to ensure that no participant felt obligated to join because of hierarchical relationships within the hospital.

3. Results and Discussion

3.1 Demographic Profile of the Nurse Respondents

3.1.1 Age Distribution

The age profile showed that most nurse respondents were young, with 46 percent belonging to the 18 to 25 age group and 32 percent belonging to the 26 to 35 age group. Only 4 percent were 36 to 45 years old, 10 percent were 46 to 55 years old, and 8 percent were 56 years old and above. Overall, 78 percent of the respondents were 35 years old and below, indicating that the emergency department workforce was largely composed of younger nurses. This finding suggests that the emergency department was primarily staffed by early-career nurses who may have strong recent theoretical preparation but limited repeated exposure to high-acuity code blue situations. Although younger nurses may demonstrate adequate knowledge of cardiopulmonary resuscitation guidelines, experience can influence confidence and consistency during actual resuscitation events. Nurses with fewer years of experience may report lower confidence despite acceptable knowledge levels (Al Sabei et al., 2021), while greater clinical exposure may strengthen self-efficacy during advanced life support interventions (Abudari et al., 2022). This highlights the need for structured experiential learning, simulation, and repeated mock code exposure.

3.1.2 Gender and Civil Status

The gender profile showed that 64 percent of the respondents were male and 36 percent were female. In terms of civil status, 63 percent were single, 33 percent were married, and 4 percent were widowed. This indicates that the respondent group had a higher proportion of male nurses and was mostly composed of single individuals. The higher proportion of male nurses differs from the general nursing trend, where females usually comprise the majority, but it reflects increasing male participation in acute and physically demanding clinical areas such as emergency care (World Health Organization, 2023). However, gender alone does not determine competency when standardized training is provided, as no significant differences in CPR skill performance between male and female nurses were observed in simulation-based assessment (Cheng et al., 2021). Civil status is not directly linked to clinical competency, although personal responsibilities may influence stress, fatigue, resilience, and work-life balance. Resilience and coping capacity are important predictors of functioning in high-stress clinical settings.

3.1.3 Educational Attainment, Clinical Experience, and Training

The findings showed that 98 percent of respondents were college graduates, while only 2 percent had postgraduate education. No respondents reported lower educational preparation. In terms of clinical experience, 36 percent had 0 to 1 year of experience, 50 percent had 1 to 3 years, 10 percent had 3 to 10 years, and 4 percent had 10 years and above. Thus, 86 percent of the respondents had three years or less of clinical experience. Regarding code blue training, 76 percent had attended relevant training, while 24 percent had not.

The high proportion of college graduates indicates that the respondents met the formal academic preparation required for professional nursing practice. Baccalaureate education supports critical thinking, clinical judgment, and patient safety outcomes (Audet et al., 2021). However, the limited postgraduate representation suggests that most nurses rely on undergraduate preparation and continuing professional development. The predominance of nurses with three years or less of experience reflects a largely novice to early-career workforce, making mentorship and frequent mock code drills important. Longer experience has been associated with stronger retention of resuscitation skills (Alshahrani et al., 2021), and experienced nurses may demonstrate stronger leadership and coordination in mock code scenarios (Lee et al., 2022). Training participation is also important because simulation-based and repetitive training improves compression quality, defibrillation timing, and team communication (Yeung et al., 2021), while mock code programs improve response time and algorithm adherence (Moon et al., 2022). The presence of 24 percent without formal training suggests a need for universal certification and refresher programs, especially because skill decay may occur within months after certification (Greif et al., 2021).

3.2 Competency Levels of Emergency Room Nurses During Code Blue Events

3.2.1 Knowledge Competency

The respondents demonstrated a very high level of knowledge competency, with an overall mean of 4.43 interpreted as strongly agree. The highest-rated indicators were understanding ethical and legal considerations related to resuscitation, with a mean of 4.87, and familiarity with the hospital's code blue activation procedures, with a mean of 4.86. Respondents also strongly agreed that they understood indications for initiating cardiopulmonary resuscitation, with a mean of 4.76; emergency resuscitation medication indications and dosages, with a mean of 4.61; post-resuscitation care after return of spontaneous circulation, with a mean of 4.63; current ACLS algorithms, with a mean of 4.44; and their specific role during code blue events, with a mean of 4.48. Comparatively lower but still acceptable ratings were recorded for identifying shockable and non-shockable rhythms, with a mean of 3.57; understanding infection control and safety precautions during resuscitation, with a mean of 3.87; and airway management principles, with a mean of 4.24.

These results suggest that emergency room nurses had a strong cognitive foundation in advanced cardiac life support, emergency pharmacology, ethical responsibilities, institutional procedures, and post-resuscitation care. Ethical decision-making and system-based activation procedures are important components of high-quality resuscitation (Greif et al., 2021). Early recognition of cardiac arrest and immediate CPR are also essential because delays reduce the likelihood of return of spontaneous circulation (Yeung et al., 2021). Knowledge of emergency medications supports adherence to advanced cardiac life support protocols (Cheng et al., 2021), while post-resuscitation care is part of the broader chain of survival (Greif et al., 2021). However, the lower ratings in rhythm identification, infection control, and airway management indicate areas requiring reinforcement. ECG interpretation improves with simulation and repeated case exposure (Lee et al., 2022), infection control remains essential in high-pressure resuscitation settings (Labrague & De los Santos, 2022), and airway management competency improves through simulation and interdisciplinary practice (Cheng et al., 2021). Although knowledge was high, knowledge alone does not guarantee performance, especially because skill retention can decline without repeated practice (Alshahrani et al., 2021).

3.2.2 Skills Competency

The respondents showed a very high level of skills competency, with an overall mean of 4.74 interpreted as strongly agree. The highest-rated skill was performing high-quality chest compressions according to guidelines, with a mean of 4.91, followed by providing effective bag-valve-mask ventilation, with a mean of 4.90. Respondents also strongly agreed that they could prepare and administer emergency medications accurately, with a mean of 4.84; ensure patient safety during resuscitation, with a mean of 4.88; assist in advanced airway management, with a mean of 4.77; prioritize tasks efficiently under pressure, with a mean of 4.77; work effectively as part of a resuscitation team, with a mean of 4.71; safely operate a defibrillator, with a mean of 4.67; accurately document code blue actions, with a mean of 4.60; and promptly initiate code blue procedures when cardiac arrest is identified, with a mean of 4.35.

The high skills competency suggests that respondents perceived themselves as capable of performing essential psychomotor and procedural tasks during code blue events. High-quality chest compressions remain central to cardiac arrest management, and resuscitation guidelines emphasize adequate compression depth, rate, recoil, and minimal interruptions (Greif et al., 2021). Training and feedback improve compression quality (Yeung et al., 2021), while simulation-based practice improves ventilation accuracy and reduces common errors (Cheng et al., 2021). Advanced airway assistance is strengthened by team-based simulation (Lee et al., 2022), and repeated hands-on exposure improves defibrillation speed and accuracy (Alshahrani et al., 2021). Medication preparation accuracy and reduction of delays are supported by structured resuscitation training (Yeung et al., 2021). Teamwork, situational awareness, and prioritization are also essential non-technical skills in resuscitation (Cheng et al., 2021), while mock codes improve team cohesion and reduce role confusion (Moon et al., 2022). Although the overall skills score was very high, self-reported competency may not always equal objective performance, and psychomotor skills may decline without regular reinforcement and feedback (Alshahrani et al., 2021).

3.2.3 Attitude Competency

The respondents demonstrated a very high level of attitude competency, with an overall mean of 4.40 interpreted as strongly agree. The highest-rated attitude indicator was valuing teamwork and clear communication during emergencies, with a mean of 4.64. Respondents also strongly agreed that they were motivated to continuously improve emergency nursing skills, with a mean of 4.56; willing to assume responsibility during code blue events, with a mean of 4.45; able to demonstrate professionalism during high-stress situations, with a mean of 4.44; able to maintain a patient-centered approach, with a mean of 4.43; able to reflect on performance for future improvement, with a mean of 4.40; able to remain calm and focused during code blue situations, with a mean of 4.36; confident in performing during resuscitation, with a mean of 4.29; and aware of the importance of supporting patients' families during code blue events, with a mean of 4.29. Acceptance of constructive feedback after code blue events received the lowest mean of 4.18, interpreted as agree.

These results indicate that emergency room nurses demonstrated positive professional attitudes, including composure, responsibility, collaboration, professionalism, patient-centeredness, and motivation for continuous improvement. Emotional regulation is important because stress and anxiety may impair decision-making and task execution during emergencies (Cheng et al., 2021). Psychological resilience also supports effective performance in high-stress clinical environments (Labrague & De los Santos, 2022). Confidence and self-efficacy influence willingness to act during cardiac arrest (Abudari et al., 2022), while accountability and defined responsibilities reduce errors and improve survival outcomes (Greif et al., 2021). Teamwork and communication are major determinants of successful resuscitation, and communication failures contribute to adverse events (Cheng et al., 2021). Structured team training and mock code simulations improve communication and reduce intervention delays (Moon et al., 2022). The lower rating for feedback acceptance suggests the need to strengthen debriefing and reflective practice because structured debriefing improves knowledge retention, teamwork behavior, and guideline adherence (Yeung et al., 2021). Professionalism and ethical responsibility remain integral to resuscitation care (Greif et al., 2021), while patient-centeredness is a core principle of quality emergency care (World Health Organization, 2023). Family support during resuscitation may also improve psychological outcomes for relatives when proper guidance is provided (Greif et al., 2021). Reflective practice and feedback loops strengthen both technical and non-technical resuscitation skills (Yeung et al., 2021).

3.3 Relationship Between Demographic Profile and Perceived Competency Levels

3.3.1 Relationship Between Demographic Variables and Knowledge, Skills, and Attitude

The correlation analysis showed no statistically significant relationship between the respondents' demographic profile and their perceived competency levels in knowledge, skills, and attitude. Age showed weak negative correlations with knowledge, skills, and attitude, with values of -0.07, -0.084, and -0.165, respectively, and all significance values were above 0.05. Gender also showed no significant relationship with knowledge, skills, or attitude, with weak and inconsistent coefficients. Civil status, educational attainment, years of experience, and training attendance likewise had no significant correlations with any competency domain. All p-values were greater than 0.05, indicating that demographic characteristics did not significantly influence perceived competency during code blue events.

These findings suggest that competency during code blue events was not determined by age, gender, civil status, education, experience, or training attendance alone. Age may not strongly influence competency when standardized protocols and frequent practice are present, because advanced life support competency is more influenced by practice frequency and training quality than chronological age (Cheng et al., 2021). Gender-based differences are also minimized when equal access to training and clinical exposure is provided, with standardized simulation assessments showing no significant differences between male and female participants (Yeung et al., 2021). Civil status may influence fatigue or coping, but resuscitation competency appears more closely related to professional preparation and team systems (Labrague & De los Santos, 2022). Educational attainment did not correlate significantly, likely because 98 percent of respondents were college graduates, creating limited variability. Continuous professional education and scenario-based reinforcement are more central to resuscitation proficiency than academic degree alone (Greif et al., 2021). Years of experience also showed no significant relationship, possibly because skill retention depends more on refresher training than total years in practice (Alshahrani et al., 2021). Training attendance did not significantly correlate with competency, likely because most respondents had similar training exposure, and competency depends on the frequency, quality, and continuity of training rather than attendance alone. Repeated, spaced simulation and debriefing produce stronger outcomes than single-session exposure (Cheng et al., 2021). Overall, the findings support the importance of standardized systems, simulation-based reinforcement, and organizational culture in reducing demographic differences in performance (Greif et al., 2021; Yeung et al., 2021).

3.4 Proposed Competency Enhancement Program

3.4.1 Enhanced Code Blue Competency Strengthening Program for Emergency Room Nurses

Based on the findings, the proposed program is the Enhanced Code Blue Competency Strengthening Program for Emergency Room Nurses. The program is designed to address competency areas that received comparatively lower ratings while maintaining the already high overall competency levels of the respondents. The identified areas for improvement include cardiac rhythm recognition, infection control and safety practices during resuscitation, airway management integration, prompt initiation of code blue procedures, documentation accuracy, and acceptance of constructive feedback after resuscitation events. The goal of the program is to enhance targeted competencies of emergency room nurses to ensure sustained high-quality, safe, and efficient performance during code blue events within six months.

The program rationale is supported by findings showing that accurate rhythm recognition and timely defibrillation are essential to survival outcomes in cardiac arrest (Cheng et al., 2021). Infection prevention during aerosol-generating procedures, including airway management, remains an important emergency care safety standard (Greif et al., 2021). Structured debriefing and feedback systems are also associated with improved team performance, communication, and skill retention (Yeung et al., 2021). Although demographic variables did not significantly influence competency levels, continuous quality improvement remains necessary, particularly because the workforce was composed largely of early-

career nurses. Strengthening the identified areas through structured ECG workshops, high-fidelity mock code simulations, rapid activation drills, documentation audit and feedback sessions, and structured post-event debriefing can support technical precision, procedural efficiency, reflective practice, and patient safety.

The program includes advanced rhythm recognition and defibrillation workshops through monthly case-based ECG interpretation sessions; infection control and airway safety simulations through quarterly high-fidelity mock code drills; rapid code blue activation drills through unannounced simulations; documentation enhancement training using standardized templates, audits, and feedback; and structured debriefing with reflective learning logs. The implementation timeline covers six months, beginning with program orientation and baseline reassessment, followed by ECG workshops, activation drills, documentation training, facilitator debriefing training, infection-control-focused mock codes, midpoint evaluation, documentation audits, reflective practice monitoring, comprehensive mock code assessment, final evaluation, and program reporting. The responsible persons include the Emergency Department Nurse Manager, Clinical Nurse Educator, Infection Control Nurse, Code Blue Committee Chair, and Quality Assurance Officer.

The proposed budget amounts to PHP 205,000, covering training manuals and printed educational materials, simulation supplies and equipment maintenance, an external ECG resource speaker honorarium, evaluation tools and audit materials, personal protective equipment for simulation drills, and logistics or contingency expenses. The evaluation plan includes monitoring attendance, participation, number of simulations, and debriefing implementation; assessing rhythm recognition before and after training; auditing infection control compliance, activation time, and documentation completeness; comparing feedback acceptance and reflective practice culture; and examining interdisciplinary feedback, sustained competency improvement after six months, and reduction of documentation discrepancies during actual code blue events. By targeting lower-rated competency indicators while sustaining high standards, the program supports continuous quality improvement and evidence-based code blue management.

4. Conclusion & Recommendations

The study concludes that emergency room nurses demonstrated strong perceived competencies in managing code blue events across the domains of knowledge, skills, and attitude. They showed adequate understanding of advanced cardiac life support principles, medication administration, post-resuscitation care, ethical considerations, and hospital activation procedures, while rhythm recognition, infection control during resuscitation, and airway management remained areas for continued reinforcement. The respondents also reported high competence in chest compressions, ventilation, emergency medication administration, patient safety, teamwork, and resuscitation performance, although prompt code blue activation and documentation accuracy require procedural improvement. Their attitudes reflected professionalism, accountability, teamwork, calmness, patient-centered care, and motivation for improvement, but feedback acceptance may still be strengthened through structured debriefing. Since no significant relationship was found between demographic variables and competency levels, the findings suggest that code blue competency is not determined by age, gender, civil status, educational attainment, years of experience, or training attendance alone, but may be supported by standardized protocols, structured emergency systems, and shared professional training.

Based on the findings, emergency departments should sustain and strengthen code blue competency through regular mock code simulations, structured post-event debriefing, standardized documentation and activation checklists, and focused training on rhythm recognition, airway management support, infection control compliance, prompt activation, documentation accuracy, and feedback acceptance. Nursing schools should increase high-fidelity simulation exposure, integrate advanced cardiac life support principles, electrocardiogram interpretation, crisis resource management, teamwork, communication, and resilience training, and collaborate with tertiary hospitals for supervised emergency simulation experiences. Hospital administrators should ensure updated life support certifications, refresher training, adequate simulation resources, performance audits, and staff resilience support, while emergency room nurses should actively participate in continuing professional development, reflective practice, peer mentoring, and interprofessional collaboration. Hospitals should also improve patient and family communication regarding resuscitation policies, advance directives, and family support, while nursing organizations and regulatory bodies should promote standardized competency assessment, periodic recertification, accredited continuing education, structured code blue training, performance audits, and support for simulation-based emergency preparedness. Future researchers may use objective performance assessment, longitudinal designs, and comparative studies across hospital settings to further examine resuscitation competency and patient outcomes.

Compliance with ethical standards

The authors declare no conflict of interest. This study complied with recognized ethical standards for human-participant research by ensuring voluntary participation with informed consent, the right to withdraw without penalty, and strict confidentiality through anonymous, secure, and aggregated data handling. Given the focus on psychological well-being,

procedures were non-invasive, and safeguards were observed to minimize discomfort, with guidance to appropriate support services when needed, and required institutional permissions were secured for instrument use and access to academic records.

REFERENCES

Abudari, G., Alnuaimi, K., Alkhalaileh, M., & Alqaralleh, B. (2022). Nurses' self-efficacy and performance in advanced cardiac life support interventions. *Journal of Nursing Management, 30*(7), 2158–2166.

Al Khalaileh, M., & AlQudah, R. (2022). Role ambiguity, job satisfaction, and turnover intention among nurses: A correlational study. *Journal of Nursing Management, 30*(2), 392–400.

Al Sabei, S. D., Labrague, L. J., Al Hadid, L., & Al Harthi, M. (2021). Knowledge, attitudes, and confidence of nurses toward cardiopulmonary resuscitation in acute care settings. *International Journal of Nursing Practice, 27*(4), e12922.

Almazan, J. U., & Albougami, A. S. (2022). Nursing workforce challenges in the Philippines: Implications for policy and practice. *International Nursing Review, 69*(3), 292–300.

Alshahrani, M. S., Alkhathami, A. M., & Alruwaili, A. M. (2021). Retention of advanced life support skills among hospital nurses. *BMC Nursing, 20*, 188.

Audet, L. A., Bourgault, P., & Rochefort, C. M. (2021). Associations between nurse education level and patient outcomes: A systematic review. *Journal of Nursing Scholarship, 53*(5), 583–592.

Bai, X., Wang, Y., & Li, H. (2020). Survival outcomes of in-hospital cardiac arrest in Asia: A systematic review. *Resuscitation, 152*, 71–79.

Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice*. Addison-Wesley Publishing Company.

Chang, Y., Chen, Y., & Hung, C. (2021). The impact of role ambiguity on clinical decision-making during emergencies: Implications for patient safety. *Journal of Advanced Nursing, 77*(8), 3584–3594.

Cheng, A., Magid, D. J., Auerbach, M., Bhanji, F., Bigham, B. L., Blewer, A. L., Dainty, K. N., Diederich, E., Lin, Y., Leary, M., Mahgoub, M., Mancini, M. E., Navarro, K., & Donoghue, A. (2020). Part 6: Resuscitation education science: 2020 American Heart Association Guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation, 142*(16_suppl_2), S551–S579. https://doi.org/10.1161/CIR.0000000000000903

Cheung, J. H., Duff, J. P., Lachance, C., et al. (2021). Leadership and team performance in resuscitation: Current evidence and implications for practice. *Resuscitation, 160*, 153–160.

Cheskes, S., Verbeek, P. R., Drennan, I. R., McLeod, S. L., Turner, L., Pinto, R., Austin, D., & Scales, D. C. (2020). Defining the impact of team dynamics and role assignment during resuscitation. *Resuscitation, 152*, 143–149.

Couper, K., Perkins, G. D., Abbas, G., Bion, J., Bray, J., Chamberlain, D., de Paolis, P., de Vries, W., Ghuysen, A., Gräsner, J. T., Monsieurs, K. G., Raffay, V., Ristagno, G., Soar, J., & Olasveengen, T. M. (2021). European Resuscitation Council Guidelines 2021: Adult basic life support. *Resuscitation, 161*, 98–114. https://doi.org/10.1016/j.resuscitation.2021.02.009

Creswell, J. W. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications.

Girotra, S., Nallamothu, B. K., Tang, Y., Chan, P. S., & the American Heart Association Get With The Guidelines–Resuscitation Investigators. (2020). Association of hospital-level acute resuscitation and postresuscitation survival with overall risk-standardized survival to discharge for in-hospital cardiac arrest. *JAMA Network Open, 3*(7), e2010403. https://doi.org/10.1001/jamanetworkopen.2020.10403

Greif, R., Lockey, A., Breckwoldt, J., Carmona, F., Conaghan, P., Kuzovlev, A., Pflanzl-Knizacek, L., Sari, F., Shammet, S., Scapigliati, A., Turner, N., Yeung, J., & Monsieurs, K. G. (2021). European Resuscitation Council Guidelines 2021: Education for resuscitation. *Resuscitation, 161*, 388–407. https://doi.org/10.1016/j.resuscitation.2021.02.016

Hazwani, T. R., Alosaimi, A., Almutairi, M., Shaheen, N., Al Hassan, Z., & Antar, M. (2020). The impact of mock code simulation on the resuscitation practice and patient outcome for children with cardiopulmonary arrest. *Cureus, 12*(7), e9197. https://doi.org/10.7759/cureus.9197

Hunt, E. A., Duval-Arnould, J. M., Chime, N. O., St. Jacques, A., Nelson-McMillan, K. L., Bradshaw, J. H., Diener-West, M., & Shilkofski, N. A. (2020). Integration of in situ simulation to improve quality and safety in healthcare. *Simulation in Healthcare, 15*(1), 48–56.

Hunziker, S., Bühlmann, C., Tschan, F., Balestra, G., Legeret, C., Schumacher, C., & Marsch, S. (2020). Teamwork and leadership in cardiopulmonary resuscitation: A simulation study. *Resuscitation, 155*, 29–35.

Labrague, L. J., & De los Santos, J. A. A. (2022). Resilience, coping behaviours and professional quality of life among nurses in high-stress clinical environments. *Journal of Nursing Management, 30*(1), 231–240.

Leary, M., Landman, A., & Hauswald, E. (2020). The effect of multidisciplinary team training on cardiac arrest survival. *Resuscitation, 156*, 45–52.

Lee, H., Kim, Y., & Park, J. (2022). Effects of simulation-based mock code training on leadership and teamwork among emergency nurses. *Nurse Education Today, 110*, 105261.

Meaney, P. A., Bobrow, B. J., Mancini, M. E., Christenson, J., de Caen, A. R., Bhanji, F., Abella, B. S., Kleinman, M. E., Edelson, D. P., Berg, R. A., Aufderheide, T. P., Menon, V., Leary, M., & CPR Quality Summit Investigators. (2013). Cardiopulmonary resuscitation quality: [Corrected] Improving cardiac resuscitation outcomes both inside and outside the hospital: A consensus statement from the American Heart Association. *Circulation, 128*(4), 417–435. https://doi.org/10.1161/CIR.0b013e31829d8654

Merchant, R. M., Topjian, A. A., Panchal, A. R., Cheng, A., Aziz, K., Berg, K. M., Lavonas, E. J., Magid, D. J., & Adult Basic and Advanced Life Support, Pediatric Basic and Advanced Life Support, Neonatal Life Support, Resuscitation Education Science, and Systems of Care Writing Groups. (2020). Part 1: Executive summary: 2020 American Heart Association Guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation, 142*(16_suppl_2), S337–S357. https://doi.org/10.1161/CIR.0000000000000918

Moon, H., Hyun, M., & Kim, H. (2022). Effects of mock code training on emergency team performance. *Nurse Education Today, 112*, 105339.

Mulla, Y., Fernandes, C., & Prabhu, A. (2021). Simulation-based team training in cardiac arrest care. *Clinical Simulation in Nursing, 55*, 79–86.

Nolan, J. P., Sandroni, C., Böttiger, B. W., Cariou, A., Cronberg, T., Friberg, H., Genbrugge, C., Haywood, K., Lilja, G., Moulaert, V. R. M., Nikolaou, N., Olasveengen, T. M., Skrifvars, M. B., Taccone, F. S., Soar, J., & European Resuscitation Council. (2021). European Resuscitation Council and European Society of Intensive Care Medicine Guidelines 2021: Post-resuscitation care. *Resuscitation, 161*, 220–269.

Perkins, G. D., Gräsner, J. T., Semeraro, F., Olasveengen, T., Soar, J., Lott, C., Van de Voorde, P., Madar, J., Zideman, D., Mentzelopoulos, S., Bossaert, L., Greif, R., Monsieurs, K. G., Svavarsdóttir, H., & Nolan, J. P. (2021). European Resuscitation Council Guidelines 2021: Executive summary. *Resuscitation, 161*, 1–60. https://doi.org/10.1016/j.resuscitation.2021.02.003

Philippine Heart Association. (2020). *Interim consensus guidelines for basic and advanced resuscitation in cardiac arrest patients during the COVID-19 outbreak*. Philippine Heart Association.

Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer.

Salas, E., Rosen, M. A., & King, H. B. (2020). Managing teams for effective performance in healthcare settings. *Current Opinion in Psychology, 36*, 25–30.

Soar, J., Böttiger, B. W., Carli, P., Couper, K., Deakin, C. D., Djärv, T., Lott, C., Olasveengen, T. M., Paal, P., Pellis, T., Perkins, G. D., Sandroni, C., & Nolan, J. P. (2021). European Resuscitation Council Guidelines 2021: Adult advanced life support. *Resuscitation, 161*, 115–151. https://doi.org/10.1016/j.resuscitation.2021.02.010

Stankovic, N., Holmberg, M. J., Høybye, M., Granfeldt, A., & Andersen, L. W. (2021). Age and sex differences in outcomes after in-hospital cardiac arrest. *Resuscitation, 165*, 58–65. https://doi.org/10.1016/j.resuscitation.2021.05.017

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Alonso, A., Beaton, A. Z., Bittencourt, M. S., Boehme, A. K., Buxton, A. E., Carson, A. P., Commodore-Mensah, Y., Elkind, M. S. V., Evenson, K. R., Eze-Nliam, C., Ferguson, J. F., Generoso, G., Ho, J. E., Kalani, R., Khan, S. S., Kissela, B. M., . . . Martin, S. S. (2022). Heart disease and stroke statistics—2022 update: A report from the American Heart Association. *Circulation, 145*(8), e153–e639. https://doi.org/10.1161/CIR.0000000000001052

Wang, T., Chen, Y., & Zhou, L. (2022). Barriers to effective code blue response in Chinese hospitals. *Journal of Critical Care, 68*, 78–85.

World Health Organization. (2020). *State of the world's nursing 2020: Investing in education, jobs and leadership*. World Health Organization.

World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

Yeung, J., Djärv, T., Hsieh, M. J., Monsieurs, K. G., Finn, J., Greif, R., & Nolan, J. P. (2021). Education, implementation, and teams: 2021 international consensus on CPR and ECC science. *Resuscitation, 167*, 288–305.