ORIGINAL ARTICLE

# Acute Medical Emergency Preparedness and Associated Factors in Community Pharmacies in Metro Manila, Philippines

Rogie Royce Carandang, PhD, MPH, MSc, RPh,[1,2]* Rev Angel Nañasca, PharmD, RPh,[1]
Pia Noreen Tuazon, PharmD, RPh,[1] Carl Lewis Hipolito, PharmD, RPh,[1] Mark Palabay[1] and Azel Joshua Getape, RPh[1]

[1]*College of Pharmacy, Adamson University, Manila, Philippines*
[2]*Department of Health, Behavior and Society, The University of Texas at San Antonio School of Public Health, San Antonio, Texas, USA*

## ABSTRACT

**Background and Objective.** Community pharmacies are among the most accessible healthcare facilities and play a critical role during medical emergencies. While many countries have implemented structured emergency preparedness systems in pharmacies, such practices remain limited and under-researched in the Philippines. The lack of empirical data on pharmacy-based emergency readiness hampers efforts to strengthen their role in crisis response and inform context-specific policies and training programs. This study aimed to assess the level of medical emergency preparedness and its associated factors among community pharmacies in Metro Manila, Philippines.

**Methods.** A community-based, cross-sectional study was conducted among 533 Filipino community pharmacy staff, consisting of 38.8% pharmacy assistants/technicians, 36.8% branch/staff pharmacists, and 24.4% managers/supervisors. Data was collected using a modified survey questionnaire administered online and face-to-face across various cities in Metro Manila. Self-efficacy and collective efficacy scales were utilized to assess medical emergency preparedness and linear regression models were employed to identify factors associated with preparedness in acute medical emergencies.

**Results.** Community pharmacies in Metro Manila are moderately prepared (overall mean scores: self-efficacy 3.65, collective efficacy 3.69 on a 1-5 scale) to respond to acute medical emergencies. Regression analysis shows that age, position, and training in first aid, cardiopulmonary resuscitation (CPR), and basic life support (BLS) are positively associated with self-efficacy. Conversely, the number of emergency equipment, pharmacy staff, and training experience are positively associated with collective efficacy.

**Conclusions.** The study's findings highlight key factors influencing the preparedness of community pharmacies in Metro Manila. Pharmacies with staff trained in first aid and CPR/BLS, as well as those equipped with adequate emergency supplies, demonstrated significantly higher levels of preparedness for medical emergencies. These results emphasize the critical role of ongoing, comprehensive training for pharmacy personnel. Ensuring that all staff are properly trained to manage acute medical situations can greatly enhance emergency response and improve patient outcomes.

*Keywords: acute medical emergency, collective efficacy, community pharmacies, emergency preparedness, self-efficacy*

Corresponding author:
Rogie Royce Z. Carandang, RPh, MPH, MSc, PhD
Department of Health, Behavior and Society
The University of Texas at San Antonio School of Public Health
San Antonio, Texas 78229, USA
Email: carandangr@uthscsa.edu
ORCiD: https://orcid.org/0000-0001-6668-911X

## INTRODUCTION

Amid growing global threats like natural disasters, pandemics, and other unexpected crises, emergency preparedness has become a fundamental aspect of community resilience. A prepared community develops, maintains, and utilizes a comprehensive emergency plan that integrates risk assessments, clearly defined roles and responsibilities, and systems for mass healthcare delivery.[1] The ability to respond effectively during emergencies can be the difference between life and death.

Achieving meaningful preparedness requires coordinated planning, responder training, and the availability of appropriate equipment and supplies.[2] Acute medical emergencies—such as cardiac events, respiratory distress, trauma, severe allergic reactions, and loss of consciousness—are often unpredictable and challenging for the public to assess.[3] In such cases, timely intervention is crucial to minimizing harm and improving health outcomes.

Preparedness must also be context-specific. Strategies should be tailored to local conditions, as urban and rural communities often differ in population density, infrastructure, and healthcare resources.[4,5] Regular evaluation and revision of preparedness plans are essential to adapt to emerging risks and ensure an effective response.

Community pharmacies have increasingly been recognized as important players in public health emergency management. Their accessibility—being located on main roads, inside malls, supermarkets, and even in underserved areas—makes them ideal points of contact during emergencies.[6] Pharmacists not only dispense medications but also provide health education, drug counseling, primary care services, and health screenings to diverse populations.[7]

The 2014 Ebola outbreak in Nigeria demonstrated the critical role of community pharmacies in public health. Pharmacies supported prevention efforts and public education, helping to mitigate the spread of the virus.[8] Similarly, during the COVID-19 pandemic, pharmacists played an essential role in vaccine administration, first aid provision, and emergency medication refills, proving their value in enhancing healthcare access and system resilience.[9] These examples underscore the importance of empowering pharmacists across all four phases of emergency management: prevention, preparedness, response, and recovery.[10]

Despite their potential, the role of community pharmacies in emergency preparedness remains underutilized in the Philippines. Research has shown that Filipinos often perceive pharmacists merely as medicine sellers, which discourages many from seeking assistance at pharmacies during medical emergencies.[11] This perception contributes to a gap in the use of community pharmacies as first responders and highlights the need to better understand and strengthen their emergency preparedness capabilities.

Although acute medical emergencies are relatively rare in pharmacy settings, they do occur.[12] As trusted and accessible members of the healthcare team, community pharmacists are well-positioned to respond to such incidents by conducting basic patient assessments, providing emergency medication refills, administering vaccines, and volunteering in shelters. However, literature on pharmacist preparedness remains limited—largely composed of narrative reports with little empirical investigation into the factors that influence readiness.[13-15]

Two key concepts essential to understanding pharmacy preparedness are self-efficacy and collective efficacy. Self-efficacy refers to an individual's belief in their ability to respond effectively to emergencies, while collective efficacy reflects a group's confidence in their shared capacity to act in such situations.[16,17] Studies in Indonesia and Australia have found that pharmacists often report varying levels of preparedness, influenced by both individual skills and team-based coordination.[16]

In the Philippines, the need to shift public perception and reframe pharmacists as frontline healthcare providers is urgent.[18,19] Improving awareness of their capabilities—not just as dispensers but as health advocates and emergency responders—can enhance their contribution to the health system, especially during crises.

This study assessed the preparedness of community pharmacies in Metro Manila to respond to acute medical emergencies, with a focus on the roles of self-efficacy and collective efficacy among pharmacy staff. It identified key factors associated with these constructs and addressed gaps in the existing literature by providing empirical evidence on what influences pharmacy emergency readiness. The findings offer valuable insights into how community pharmacists can be better supported to enhance their role in emergency response. Strengthening the preparedness of these pharmacies can ultimately improve access to emergency care and bolster community resilience in the Philippines.

## METHODS

### Research Design and Setting

This community-based, cross-sectional study was conducted from August 2023 to June 2024 in Metro Manila, Philippines. Metro Manila comprises 1,710 barangays (communities) and includes one municipality and 16 highly urbanized cities. As the country's economic center, it is the most developed and the third most densely populated area in Southeast Asia.[20] It also has the highest concentration of community pharmacies in the Philippines.[21] The region's rapid urban development, diverse population, and concentrated economic activity make it particularly vulnerable to various emergencies, including natural disasters and complex urban challenges.

### Selection of Participants

Participants included registered community pharmacists and community pharmacy staff—such as pharmacy

technicians and assistants—currently employed in Metro Manila, Philippines.

## Recruitment and Data Collection

The study employed purposive sampling as its recruitment strategy. Participants provided informed consent prior to beginning the survey, which was administered in both pen-and-paper and web-based formats. Researchers collaborated with pharmaceutical chain drugstore organizations and non-governmental organizations to disseminate the web-based survey link, which included information about the study's objectives, data handling procedures, and privacy policies. Sociodemographic data were collected as part of the baseline survey.

To ensure completeness and transparency in reporting, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used to guide the presentation of study methods and results.

## Inclusion Criteria

Eligible participants met the following criteria: (1) registered community pharmacists, pharmacy assistants, or pharmacy technicians currently employed in a community pharmacy in Metro Manila; (2) Filipino citizens; and (3) aged 20 to 45 years.

## Exclusion Criteria

Participants who did not provide informed consent were excluded from the study. In addition, individuals working as hospital pharmacists, institutional pharmacists, or those employed in telepharmacy settings were also excluded.

## Variables and Measurements

### *Outcome Variables: Emergency Preparedness*

The researchers used self-efficacy and collective efficacy scales, adapted from a study conducted in Davao City, to assess emergency preparedness.[22] Responses to each item were summarized, and mean scores were calculated to gauge participants' overall preparedness. Sample self-efficacy statements included, "I am able to conduct an initial assessment of an acutely ill patient that occurs within the pharmacy," and "I am confident that I am prepared to deal with a medical emergency in my pharmacy." Collective efficacy statements included, "My pharmacy coworkers and I can rely on each other to do our part in addressing a medical emergency," and "My pharmacy has a list of different suppliers with contact numbers to facilitate emergency purchases." Response options ranged from 1 (Strongly disagree) to 5 (Strongly agree). Preparedness levels were categorized as follows: 5.00 indicated "very high preparedness," 4.00–4.99 "high preparedness," 3.00–3.99 "moderate preparedness," 2.00–2.99 "low preparedness," and 1.00–1.99 "very low preparedness." The overall mean scores reflected participants' self and collective emergency preparedness, with higher scores indicating greater confidence and effectiveness in responding to acute medical emergencies. The scales demonstrated good reliability, with Cronbach's alpha values of 0.94 for self-efficacy and 0.92 for collective efficacy.

### *Exposure Variables: Emergency Certifications, Emergency Equipment, and Experience on Medical Emergency*

Participants were assessed for training in first aid, cardiopulmonary resuscitation/basic life support (CPR/BLS), advanced cardiac life support (ACLS), and pediatric advanced life support (PALS) using a checklist to collect data on emergency certifications. These training certifications were included as exposure variables in analyses of both self- and collective efficacy.

Additionally, the authors incorporated a modified emergency equipment checklist, adapted from international standards but tailored for community pharmacy settings. The number of emergency equipment items was summarized using descriptive statistics (Appendix A) and included in analyses related to collective efficacy.

Participants were also asked whether they had encountered any patient medical emergencies while working in a community pharmacy, including incidents such as breathing difficulties (e.g., choking), asthma attacks, heart attacks, unresponsiveness, trauma, anaphylaxis, diabetic emergencies, and seizures. An "Other" option allowed participants to specify additional emergencies. The total number of reported emergency experiences was calculated and treated as a continuous variable, which was included in analyses of both self and collective efficacy.

### *Control Variables: Participant Characteristics, Pharmacies' Characteristics, and Study Site*

The researchers collected data on characteristics of community pharmacists and pharmacy staff, including age, sex, educational level, position in the pharmacy, number of pharmacy staff, years of experience, type of pharmacy, and pharmacy location. Sex was dichotomized as male or female, while educational attainment was categorized into three groups: BS Pharmacy and higher, other degrees, and undergraduate/high school or lower. Pharmacy positions were grouped as pharmacy assistant/technician, manager/supervisor, and branch/staff pharmacist. The type of pharmacy was classified as independent, chain drugstore, or grocery store with an in-store pharmacy. Pharmacy location was identified via a checklist or dropdown menu in the web-based questionnaire and categorized by cities or municipality within Metro Manila.

These exposure variables were considered potential influencers of the study outcomes. Age, sex, educational level, job position, and years of experience were included in the analysis for self-efficacy, while type of pharmacy, years of operation, and number of pharmacy staff were included in the analysis for collective efficacy.

## Data Analysis

After excluding participants with missing data (n=12), the final analytical sample included 533 participants with complete responses. Descriptive statistics were used to summarize participants' sociodemographic characteristics, which were presented using cross-tabulations. The availability of medical emergency equipment was also listed and summarized. Mean scores for the self-efficacy and collective efficacy scales were calculated and interpreted according to the scoring criteria for the outcome variables.

Correlation analyses between numerical and categorical variables and the mean self-efficacy and collective efficacy scores were performed using Spearman's correlation and Analysis of Variance (ANOVA), respectively. Since Eta correlation analysis is not available in Stata 13.1, ANOVA was used to approximate the Eta coefficient by dividing the partial sum of squares (SS) by the total sum of squares (SS).

A forward elimination process was employed to systematically select the most relevant exposure variables for the regression model, simplifying the model and improving interpretability. Significant factors identified in the correlation analyses were included in the final multiple linear regression models for self-efficacy and collective efficacy, controlling for study sites.

To assess multicollinearity, variance inflation factor (VIF) analysis was conducted, with all VIF values below 5, indicating no significant multicollinearity. All statistical analyses were performed using Stata 13.1 (StataCorp, College Station, TX, USA), with a two-tailed significance level set at 0.05.

## Ethical Considerations

The study was approved by the University Ethics Review Committee of Adamson University (Approval Code: 2024-02-PHA-02). Written or online informed consent was obtained from all participants prior to their participation. Data collection took place from February to April 2024.

# RESULTS

Table 1 presents the general characteristics of the 533 study participants. Of these, 287 (53.9%) were male, with the largest age group being 26–30 years old (39.2%). The majority held a BS in Pharmacy or higher (85.2%). The most common position was Pharmacy Assistant/Technician (38.8%), and nearly half of the participants (48.0%) reported having 3–5 years of experience working in a community pharmacy.

Regarding medical emergency training, a high percentage (81.8%) reported having first aid certification, which is crucial for immediate emergency response. Similarly, 65.7% had training in CPR/Basic Life Support, essential for lifesaving interventions in certain situations. In contrast, 99% of respondents reported no training in ACLS or PALS. Additionally, over half of the participants (55%) had experienced medical emergencies while working in the pharmacy.

**Table 1.** Characteristics of Respondents (n = 533)[a]

| Characteristics | n | % |
|---|---|---|
| ***Sex*** | | |
| Male | 287 | 53.9 |
| Female | 246 | 46.1 |
| ***Age (years)*** | | |
| 21-25 | 124 | 23.3 |
| 26-30 | 209 | 39.2 |
| 31-35 | 137 | 25.7 |
| 36 and above | 19 | 11.8 |
| ***Education*** | | |
| BS Pharmacy and higher | 454 | 85.2 |
| Others | 53 | 9.9 |
| Undergraduate/Highschool or lower | 26 | 4.9 |
| ***Position*** | | |
| Pharmacy Assistant/Technician | 207 | 38.8 |
| Manager/Supervisor | 130 | 24.4 |
| Branch/Staff Pharmacist | 196 | 36.8 |
| ***Years of Experience*** | | |
| 2 or less | 129 | 24.2 |
| 3-5 | 256 | 48.0 |
| 6 and above | 148 | 27.8 |
| ***Has First Aid Training*** | | |
| Yes | 436 | 81.8 |
| No | 97 | 18.2 |
| ***Has CPR/Basic Life Support Training*** | | |
| Yes | 350 | 65.7 |
| No | 183 | 34.3 |
| ***Has Advanced Cardiac Life Support (ACLS) Training*** | | |
| Yes | 3 | 0.6 |
| No | 530 | 99.4 |
| ***Has Pediatric Advanced Life Support (PALS) Training*** | | |
| Yes | 1 | 0.2 |
| No | 532 | 99.8 |
| ***Has Experienced Medical Emergencies*** | | |
| Yes | 293 | 55.0 |
| No | 240 | 45.0 |

[a] *Participants were recruited from across Metro Manila, including Caloocan (n=46), Las Piñas (n=21), Makati (n=16), Malabon (n=45), Mandaluyong (n=18), Manila (n=27), Marikina (n=45), Muntinlupa (n=19), Navotas (n=46), Parañaque (n=23), Pasay (n=19), Pasig (n=40), Pateros (n=24), Quezon City (n=59), San Juan (n=14), Taguig (n=25), and Valenzuela (n=46).*

Table 2 presents the characteristics of community pharmacies in Metro Manila. The majority were independent pharmacies (57.2%). The most common range of years in operation was 6–10 years (44.3%). Nearly half of the pharmacies (46.7%) employed 2–3 registered pharmacists, while the largest proportion (30.1%) had 2–3 pharmacy assistants or technicians.

Table 3 presents the mean scores for each item on the self-efficacy scale. The highest-rated item was S2: "I am able to identify a 'sick' vs. 'non-sick' patient within the pharmacy." In contrast, the lowest-rated item was S7: "I am able to perform splinting/fracture care within the pharmacy." The

**Table 2.** Characteristics of Community Pharmacies (n = 533)[a]

| Characteristics | n | % |
|---|---|---|
| ***Type of Pharmacy*** | | |
| Independent Pharmacy | 305 | 57.2 |
| Chain Drug Store | 183 | 34.3 |
| Grocery with In-store pharmacy | 45 | 8.4 |
| ***Years of Operation*** | | |
| 1-5 | 130 | 24.4 |
| 6-10 | 236 | 44.3 |
| 11 and above | 167 | 31.3 |
| ***Number of Registered Pharmacists*** | | |
| 0-1 | 158 | 29.7 |
| 2-3 | 249 | 46.7 |
| 4 and above | 126 | 23.6 |
| ***Number of Pharmacy Assistant/Technician*** | | |
| 0-1 | 97 | 18.2 |
| 2-3 | 160 | 30.1 |
| 4 and above | 276 | 51.8 |

[a] *Participants were recruited from across Metro Manila, including Caloocan (n=46), Las Piñas (n=21), Makati (n=16), Malabon (n=45), Mandaluyong (n=18), Manila (n=27), Marikina (n=45), Muntinlupa (n=19), Navotas (n=46), Parañaque (n=23), Pasay (n=19), Pasig (n=40), Pateros (n=24), Quezon City (n=59), San Juan (n=14), Taguig (n=25), and Valenzuela (n=46).*

overall mean self-efficacy score was 3.65, suggesting that community pharmacists and pharmacy staff in Metro Manila perceive themselves as moderately prepared to respond to medical emergencies.

Table 4 presents the mean scores for each item on the collective efficacy scale. The highest-rated item was C15: "My pharmacy has a list of different suppliers with contact numbers to facilitate emergency purchases," with a mean score of 4.28. Conversely, the lowest-rated item was C4: "My pharmacy coworkers and I can effectively use an Automated External Defibrillator (AED)," with a mean score of 1.89. The overall mean collective efficacy score was 3.69, indicating that pharmacy teams in Metro Manila perceive themselves as moderately prepared to respond collectively to medical emergencies.

## Factors Associated with Self-efficacy and Collective Efficacy in Emergency Preparedness

Correlation analysis was conducted prior to regression analysis. Variables that are significant in the analysis proceed to the regression models (Appendix B).

Table 5 presents the factors associated with community pharmacy staff's self-efficacy in managing acute medical emergencies. In the adjusted model, increasing age was significantly associated with higher self-efficacy (B = 0.03, 95% Confidence Interval [CI]: 0.01, 0.04). Compared to those with a BS in Pharmacy or higher, participants with other degrees (B = –0.90, 95% CI: –1.11, –0.69) and those with an undergraduate or high school education or lower (B = –0.32, 95% CI: –0.55, –0.09) demonstrated significantly lower self-efficacy.

Pharmacy position was also a significant factor: manager/supervisors (B = 0.19, 95% CI: 0.05, 0.34) and branch/staff pharmacists (B = 0.26, 95% CI: 0.16, 0.37) reported higher self-efficacy compared to pharmacy assistants/technicians. Interestingly, years of experience were negatively associated with self-efficacy (B = –0.05, 95% CI: –0.09, –0.02).

Training in first aid (B = 0.45, 95% CI: 0.25, 0.66) and CPR/BLS (B = 0.46, 95% CI: 0.32, 0.60) were both significantly associated with higher self-efficacy scores.

Table 6 presents the factors associated with the collective efficacy of community pharmacies in responding to acute medical emergencies. In the adjusted model, employment in chain drug stores (B = –0.42, 95% CI: –0.71, –0.13) and

**Table 3.** Mean Scores of the Self-efficacy Scale

| Items | Mean (SD) |
|---|---|
| S1. I am able to conduct an initial assessment of an acutely ill patient that occur within the pharmacy. | 3.81 (1.23) |
| S2. I am able to identify a "sick" vs. "non-sick" patient that occur within the pharmacy. | 4.29 (0.75) |
| S3. I am able to formulate a differential diagnosis list that occur within the pharmacy. | 3.19 (1.06) |
| S4. I am able to develop an appropriate management plan for emergency cases that occur within the pharmacy. | 3.75 (1.00) |
| S5. I am able to perform wound closure and repair that occur within the pharmacy. | 3.18 (1.26) |
| S6. I am able to perform basic life support that occur within the pharmacy. | 3.36 (1.30) |
| S7. I am able to perform splinting/fracture care that occur within the pharmacy. | 2.95 (1.06) |
| S8. I am able to assist someone who is choking within the pharmacy. | 3.62 (1.06) |
| S9. I am able to help someone who is bleeding severely in my pharmacy. | 3.52 (1.17) |
| S10. I can keep my composure when addressing a medical emergency in my pharmacy. | 3.95 (0.81) |
| S11. I am able to deal with my own stress when addressing a medical emergency occurring in my pharmacy. | 3.99 (0.98) |
| S12. I am confident that I will be able to apply my emergency training if the need arises in my pharmacy. | 3.79 (1.05) |
| S13. I am confident that I am prepared to deal with a medical emergency in my pharmacy. | 4.05 (0.87) |
| ***Overall Mean*** | **3.65** |

*Preparedness levels were categorized as follows: 5.00 indicated "very high preparedness," 4.00–4.99 "high preparedness," 3.00–3.99 "moderate preparedness," 2.00–2.99 "low preparedness," and 1.00–1.99 "very low preparedness."*

**Table 4.** Mean Scores of the Collective Efficacy Scale

| Items | Mean (SD) |
|---|---|
| C1. My pharmacy can effectively manage an emergency medical situation. | 3.94 (1.00) |
| C2. My pharmacy is prepared to deal with medical emergencies that occur within it. | 4.08 (0.82) |
| C3. My pharmacy co-workers and I can effectively work together to perform CPR. | 3.38 (1.13) |
| C4. My pharmacy co-workers and I can effectively work together to use an Automated External Defibrillator (AED). | 1.89 (1.43) |
| C5. My pharmacy co-workers and I can effectively work together to perform rescue breathing. | 3.33 (1.48) |
| C6. My pharmacy would be able to effectively work with rescue personnel in addressing medical emergencies. | 3.81 (0.95) |
| C7. My pharmacy co-workers and I can rely on each other to do our part in addressing a medical emergency. | 4.24 (0.80) |
| C8. My co-workers and I would work well together in crisis situations. | 3.77 (0.98) |
| C9. There is a protocol in place at my pharmacy regarding handling medical situations. | 3.89 (1.26) |
| C10. My pharmacy promotes medical emergency awareness among its staff members. | 3.96 (0.93) |
| C11. I can count on my colleagues to contribute to handling an acute medical emergency situation. | 3.94 (0.94) |
| C12. My pharmacy annually conducts a mock drill to simulate emergency situations. | 2.86 (1.47) |
| C13. My pharmacy has past experiences in responding to emergencies effectively. | 3.56 (1.26) |
| C14. My pharmacy has an emergency contact number of frontline personnel for continuous service. | 4.22 (0.94) |
| C15. My pharmacy has a list of different suppliers with contact numbers to facilitate emergency purchases needed. | 4.28 (0.87) |
| C16. My pharmacy has a protocol that includes evacuation planning in times of emergency. | 3.87 (1.38) |
| ***Overall mean*** | **3.69** |

*Preparedness levels were categorized as follows: 5.00 indicated "very high preparedness," 4.00–4.99 "high preparedness," 3.00–3.99 "moderate preparedness," 2.00–2.99 "low preparedness," and 1.00–1.99 "very low preparedness."*

**Table 5.** Factors Associated with Self-efficacy

| Variables | Unadjusted | | Adjusted | |
|---|---|---|---|---|
| | B (95% CI) | *p*-value | B (95% CI) | *p*-value |
| ***Age*** | 0.02 (0.01, 0.03) | 0.001 | 0.03 (0.01, 0.04) | 0.002 |
| ***Education*** (vs. BS Pharmacy or higher) | | | | |
| Other degrees | -1.35 (-1.53, -1.18) | <0.001 | -0.90 (-1.11, -0.69) | <0.001 |
| Undergraduate/ High school or lower | -1.15 (-1.30, -1.18) | <0.001 | -0.32 (-0.55, -0.09) | 0.009 |
| ***Position*** (vs. Pharmacy assistant/technician) | | | | |
| Manager/Supervisor | 0.67 (0.51, 0.84) | <0.001 | 0.19 (0.05, 0.34) | 0.011 |
| Branch/Staff Pharmacist | 0.88 (0.74, 1.02) | <0.001 | 0.26 (0.16, 0.37) | <0.001 |
| ***Years of experience*** | 0.03 (0.00, 0.06) | 0.040 | -0.05 (-0.09, -0.02) | 0.009 |
| ***First Aid Training*** (vs. No) | 0.82 (0.66, 0.99) | <0.001 | 0.45 (0.25,0.66) | <0.001 |
| ***CPR/BLS Training*** (vs. No) | 1.00 (0.90, 1.11) | <0.001 | 0.46 (0.32, 0.60) | <0.001 |

*B — unstandardized coefficients, CI — confidence interval*

**Table 6.** Factors Associated with Collective Efficacy

| Variables | Unadjusted | | Adjusted | |
|---|---|---|---|---|
| | B (95% CI) | *p*-value | B (95% CI) | *p*-value |
| ***Type of Pharmacy*** (vs. Independent pharmacy) | | | | |
| Chain drugstore | 0.33 (0.15, 0.51) | 0.001 | -0.42 (-0.71, -0.13) | 0.007 |
| Grocery with In-store pharmacy | -0.09 (-0.30, 0.13) | 0.419 | -0.52 (-0.69, -0.36) | <0.001 |
| ***Years of Operation*** | 0.11 (0.03, 0.18) | 0.007 | -0.08 (-0.16, -0.01) | 0.030 |
| ***Number of Equipment*** | 0.07 (0.06, 0.90) | <0.001 | 0.03 (0.01, 0.04) | 0.001 |
| ***Number of Registered Pharmacists*** | 0.31 (0.26, 0.36) | <0.001 | 0.29 (0.21, 0.38) | <0.001 |
| ***Number of Pharmacy Assistant/Pharmacy Technician*** | 0.13 (0.10, 0.17) | <0.001 | 0.02 (-0.03, 0.07) | 0.377 |
| ***First Aid Training*** (vs. No) | 1.14 (0.95, 1.34) | <0.001 | 0.69 (0.56, 0.83) | <0.001 |
| ***CPR/BLS Training*** (vs. No) | 0.90 (0.73, 1.08) | <0.001 | 0.26 (0.12, 0.40) | 0.001 |

*B — unstandardized coefficients, CI — confidence interval*

grocery stores with in-store pharmacies (B = –0.52, 95% CI: –0.69, –0.36) was significantly associated with lower collective efficacy compared to independent pharmacies. Additionally, longer years of pharmacy operation were linked to decreased collective efficacy (B = –0.08, 95% CI: –0.16, –0.01).

Conversely, factors associated with increased collective efficacy included a greater number of emergency equipment items (B = 0.03, 95% CI: 0.01, 0.04), a higher number of registered pharmacists (B = 0.29, 95% CI: 0.21, 0.38), and completion of first aid (B = 0.69, 95% CI: 0.56, 0.83) and CPR/BLS training (B = 0.26, 95% CI: 0.12, 0.40).

## DISCUSSION

Participants' age, educational level, job position, and emergency training certifications were positively associated with self-efficacy in emergency preparedness. In contrast, more years of experience were linked to lower self-efficacy. For collective efficacy, a greater number of registered pharmacists, the availability of medical equipment, and the presence of emergency training certifications were positively associated with stronger collective efficacy. However, collective efficacy was lower in chain drugstores and grocery stores with in-store pharmacies compared to independent pharmacies. Additionally, a greater number of years in operation was negatively associated with collective efficacy.

Age and education were significantly associated with self-efficacy in emergency preparedness. While previous studies have suggested that aging may reduce self-efficacy and increase risk,[23–25] our findings indicate the opposite: self-efficacy improved with increasing age. This could be attributed to the accumulation of diverse personal and professional experiences that enhance confidence in handling emergencies. Similarly, higher educational attainment was associated with greater self-efficacy, likely due to enhanced abstract reasoning and anticipatory decision-making skills. In particular, individuals holding a Bachelor of Science in Pharmacy or higher demonstrated stronger self-efficacy compared to those with lower educational levels. This finding aligns with a study conducted in Thailand,[26] which found that more educated individuals had greater awareness of emergency risks and were better prepared. These results underscore the role of education as a preventive measure that promotes emergency readiness and facilitates the adoption of preparedness practices.

Job position and years of experience influenced self-efficacy, while staff size and years of operation impacted collective efficacy. Individuals in managerial or supervisory roles exhibited higher self-efficacy, likely due to greater decision-making responsibilities, autonomy, and access to training opportunities. In contrast, longer years of experience were unexpectedly associated with lower self-efficacy in emergency preparedness. This may reflect the effects of professional complacency, reduced motivation to pursue further training, or burnout resulting from prolonged exposure to routine tasks without frequent emergency encounters. Regarding collective efficacy, a larger number of staff members was positively associated with stronger collective efficacy, particularly in the context of emergency preparedness training. However, longer years of pharmacy operation were negatively associated with collective efficacy. One possible explanation is that older, more established pharmacies may be slower to adopt updated emergency protocols, invest in modern equipment, or promote team-based training initiatives. Organizational inertia and reliance on outdated routines may further hinder collaborative engagement in emergency preparedness. These findings highlight the need for further research to better understand how institutional age and culture affect team-based emergency readiness.

The findings indicate that familiarity with emergency equipment significantly enhances confidence in managing emergencies. Hands-on experience with such equipment not only makes emergencies more manageable but also improves patient outcomes. Supporting this, a cross-sectional study from Ecuador found that healthcare providers trained in advanced life support equipment reported greater confidence in managing cardiac emergencies.[27] Practical, experiential training enhances both knowledge and comfort in using emergency tools effectively. However, in our study, participants reported limited exposure to automated external defibrillators (AEDs) and other advanced life support devices. This underscores the need for emergency equipment—such as AEDs, oxygen tanks, and first aid kits—to be readily available and for staff to be properly trained in their use. Such preparedness is crucial and may be the difference between life and death in critical situations.

Training and drill exercises are increasingly recognized as essential strategies for enhancing emergency preparedness. Although basic life support (BLS) certification is not a formal requirement for pharmacists in the Philippines, it is strongly recommended to enhance professional competence and response capacity. In this study, 81.8% of community pharmacy personnel reported receiving first aid training, which is critical for immediate and effective emergency response. However, a descriptive study in Batangas City found that most community pharmacists are not required to obtain CPR or first aid certification, as licensure is typically based only on a Bachelor's degree and passing the board examination.[11] Additionally, pharmacy school curricula often lack structured emergency training. This gap highlights the need to institutionalize certified training in CPR, BLS, and first aid to equip pharmacy staff with the skills needed to manage common emergencies such as choking, wounds, and allergic reactions. Advanced training in areas such as advanced life support (ALS) and pediatric advanced life support (PALS) should also be prioritized, especially given that 99% of participants had no experience in these areas. The study's findings underscore strong positive associations between emergency training and both self-efficacy and collective efficacy, emphasizing the importance

of integrating formal emergency preparedness education into pharmacy practice.

This study has several notable strengths and limitations. One key strength is its broad geographic coverage, which exceeds that of other local studies. Additionally, the analysis of multiple contributing factors—including sociodemographic characteristics, equipment availability, and organizational features—provides a comprehensive understanding of the influences on both self-efficacy and collective efficacy in emergency preparedness. However, the cross-sectional design limits our ability to draw causal inferences. As such, we cannot determine whether improvements in self-efficacy and collective efficacy would directly lead to better emergency responses among community pharmacy personnel. Future research using more robust study designs, such as randomized controlled trials or longitudinal studies, is recommended to explore these relationships further. Lastly, the use of online recruitment may have introduced self-selection bias, as individuals with prior experience or interest in emergency preparedness may have been more likely to participate.

## CONCLUSIONS

This study highlights the critical role of both self-efficacy and collective efficacy in strengthening emergency preparedness in community pharmacy settings. Key individual-level factors—including age, education, job position, and emergency training—positively influence self-efficacy, while organizational characteristics such as staff size and access to medical equipment enhance collective efficacy. Conversely, longer years of professional experience and pharmacy operation were negatively associated with efficacy outcomes, suggesting potential challenges related to complacency, outdated practices, or limited adaptation to new protocols. Limited exposure to emergency equipment and gaps in structured emergency training further underscore the need for targeted interventions. Strengthening emergency preparedness will require institutionalizing certified training in first aid, CPR, BLS, ALS, and PALS, as well as ensuring access to critical emergency equipment. These findings underscore the importance of emergency preparedness in pharmacy practice and may inform efforts by policymakers and educators to integrate relevant content into pharmacy curricula and explore opportunities for standardized training and certification, particularly in both urban and rural contexts. By addressing these gaps, community pharmacies can be better equipped to respond effectively to medical emergencies, ultimately improving public health outcomes.

### Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

### Author Disclosure

All authors declared no conflicts of interest.

### Funding Source

None.

## REFERENCES

1. Centers for Disease Control and Prevention, Public health emergency preparedness and response capabilities: national standards for state, local, tribal, and territorial public health [Internet]. 2018 [cited 2025 Aug]. Available from: https://stacks.cdc.gov/view/cdc/60062.
2. Woesler M, Sass HM. Medicine and Ethics in Times of Corona [Internet]. LIT Verlag Münster. 2020 [cited 2024 June]. Available from: https://www.who.int/publications/i/item/a-strategic-framework-for-emergency-preparedness.
3. Colling R, York TW. Emergency Preparedness — Planning and Management. Hospital and healthcare security. 2010 Mar;591-619. doi: 10.1016/b978-0-12-385246-5.00042-0. PMCID: PMC7152024.
4. Urban Preparedness | Strategic Partnership for Health Security and Emergency Preparedness (SPH) Portal. [Internet]. 2022 [cited 2024 June]. Available from: https://extranet.who.int/sph/urban-preparedness.
5. Nelson C, Lurie N, Wasserman J, Zakowski S. Conceptualizing and Defining Public Health Emergency Preparedness. American journal of public health. 2007 Apr;97(Supplement_1):S9-S11. doi: 10.2105/ajph.2007.114496. PMID: 17413078; PMCID: PMC1854988.
6. World, The legal and regulatory framework for community pharmacies in the WHO European Region [Internet]. 2019 [cited 2024 Jun]. Available from: https://iris.who.int/bitstream/handle/10665/326394/9789289054249-eng.pdf.
7. Manolakis, PG, Skelton JB. Pharmacists' contributions to primary care in the United States collaborating to address unmet patient care needs: the emerging role for pharmacists to address the shortage of primary care providers. Am J Pharm Educ. 2010 Dec;74(10), S7. doi: 10.5688/aj7410s7.
8. Marshall S. How pharmacists in Nigeria are helping to manage the Ebola outbreak. The Pharmaceutical Journal. 2014 Sept. doi: 10.1211/PJ.2014.20066590.
9. Meghana A, Truong HA, Clark S. Pharmacy Emergency Preparedness and Response (PEPR): A Proposed Framework for Expanding Pharmacy Professionals' Roles and Contributions to Emergency Preparedness and Response during the COVID-19 Pandemic and Beyond. Research in social & administrative pharmacy/Research in social and administrative pharmacy. 2021 Jan;17 (1), 1967–1977. doi: 10.1016/j.sapharm.2020.04.002. PMID: 32389631. PMCID: PMC7146711.
10. Rimmer A. (2020). Covid-19: GPs can stop health checks for over 75s and routine medicine reviews. the BMJ. 2020 Mar;368(1157), 10-1136. doi: 10.1136/bmj.m1157
11. Garcia IB, Dolor IA, Inandan HE, Patitico CAM, Cobeng AD, De Guzman TAH. An assessment of community pharmacists' preparedness for acute medical emergencies in Batangas City. [Internet]. 2021 [cited 2025 Mar]. Available from: https://research.lpubatangas.edu.ph/wpcontent/uploads/2022/06/An-Assessment-of-Community-PharmacistsPreparedness-for-Acute-Medical-Emergencies-in-Batangas-City.pdf.
12. Henkel PJ, Marvanova M. Basic Disaster Preparedness of Rural Community Pharmacies in 5 States. Disaster medicine and public health preparedness. 2019 Jun;14(3):329-334. doi: 10.1017/dmp.2019.57. PMID: 31370915.
13. O'Dwyer N, Cliffe H, Watson KE, McCourt E, Singleton JA. Continuation of opioid replacement program delivery in the aftermath of cyclones in Queensland, Australia: A qualitative exploration of the perspectives of pharmacists and opioid replacement therapy staff. Research in social & administrative pharmacy/Research in social and administrative pharmacy. 2020 Aug;16(8):1081-1086. doi: 10.1016/j.sapharm.2019.11.007. PMID: 31753692.
14. Ozeki K, Toshiyuki Ojima. Current Status of Disaster Preparedness of Pharmacies and Differences in Disaster Awareness Based on Pharmacy Size. Disaster medicine and public health preparedness. 2019 Aug; 13(4):753-757. doi: 10.1017/dmp.2018.160. PMID: 30832744.

15. Schumacher L, Bonnabry P, Widmer N. Emergency and Disaster Preparedness of European Hospital Pharmacists: A Survey. Disaster Med Public Health Prep. 2021 Feb;15(1):25-33. doi: 10.1017/dmp.2019.112. PMID: 31739816.
16. McCourt EM, Singleton JA, Tippett V, Nissen LM. Evaluation of Disaster Preparedness and Preparedness Behaviors among Pharmacists: A Cross-Sectional Study in Australia. Prehosp Disaster Med. 2021 Jun;36(3):354-361. doi: 10.1017/S1049023X21000133. PMID: 33632357.
17. Babcicky P, Seebauer S. Collective efficacy and natural hazards: differing roles of social cohesion and task-specific efficacy in shaping risk and coping beliefs. Journal of Risk Research. 2019 Jun;23(6), 695–712. doi: 10.1080/13669877.2019.1628096.
18. Christian K, Arteta G, Basto ML, et al. Public awareness, expectations, and views on community pharmacist's roles and practices in the Philippines. GSC biological and pharmaceutical sciences. 2022 Jun; 20(1):022-031. doi: 10.30574/gscbps.2022.20.1.0260.
19. Breaking the stigma of community pharmacy in the Philippines. [Internet]. 2023. [cited 2024 Jun]. Available from: https://www.studocu.com/ph/document/de-la-salle-medical-and-health-sciences-institute/pharmacognosy/breaking-the-stigma-of-community-pharmacy-in-the-philippines/87928248.
20. Population density in South East Asia. [Internet]. 2021. [cited 2024 Jun]. Available from: https://www.theglobaleconomy.com/rankings/population_density/South-East-Asia/.
21. Romano M. Invest in the Philippine Real Estate Market Today. [Internet]. 2018. [cited 2024 Mar]. Available from: https://housinginteractive.com.ph/blog/invest-in-the-philippine-real-estate-market-today/.
22. Badong V, Villarin E. Determination of community and hospital pharmacists respond in emergency and disaster. Research Gate. 2019 Jul. doi: 10.13140//RG.2.2.25469.92649.
23. Cong Z, Chen Z, Liang D. Barriers to preparing for disasters: Age differences and caregiving responsibilities. International journal of disaster risk reduction. 2021 Jul;61:102338-102338. doi: 10.1016/j.ijdrr.2021.102338
24. Grembowski D, Patrick D, Diehr P, Durham M, Beresford S, Kay E, et al. Self-efficacy and health behavior among older adults. J Health Soc Behav. 1993 Jun;34(2):89-104. PMID: 8277130.
25. Cadiz DM, Hammer LB, Truxillo DM. Supporting the Aging Workforce: A Review and Recommendations for Workplace Intervention Research. Annual Review of Organizational Psychology and Organizational Behavior. 2015 Apr;2:351-381. doi: 10.1146/annurev-orgpsych-032414-111435.
26. Hoffmann R, Muttarak, R. Learn from the Past, Prepare for the Future: Impacts of Education and Experience on Disaster Preparedness in the Philippines and Thailand. World development. 2017 Aug;96:32-51. doi: 10.1016/j.worlddev.2017.02.016.
27. Izquierdo-Condoy JS, Arias Rodríguez FD, Duque-Sánchez E, Alegría NN, Rojas Cadena M, Naranjo-Lara P, et al. Assessment of preparedness and proficiency in basic and advanced life support among nursing professionals: a cross-sectional study. Front Med (Lausanne). 2024 Jan;11:1328573. doi: 10.3389/fmed.2024.1328573. PMID: 38318246. PMCID: PMC10840996.

# APPENDICES

**Appendix A.** Summary distribution of emergency equipment

| Equipment [a] | n | % |
|---|---|---|
| First aid kit | 490 | 96.7 |
| Face mask | 481 | 94.9 |
| Gloves | 479 | 94.5 |
| Soap | 478 | 94.3 |
| Thermometer | 476 | 93.9 |
| Bandage, Medical plaster | 474 | 93.5 |
| Blood pressure measuring equipment | 469 | 92.5 |
| Scissors | 442 | 87.2 |
| Syringe with needles (disposable) | 424 | 83.6 |
| Inhaler | 397 | 78.3 |
| Gauze pad | 393 | 77.5 |
| Stethoscope | 300 | 59.2 |
| Eye protection | 292 | 57.6 |
| Light source (lamp and flashlight) | 286 | 56.4 |
| Resuscitator bag valve and mask | 222 | 43.8 |
| Tourniquet | 194 | 38.3 |
| Splint for arm, leg | 174 | 34.3 |
| Protective gown/apron | 171 | 33.7 |
| Needle and suture | 166 | 32.7 |
| Forceps | 146 | 28.8 |
| Glucagon emergency kit | 144 | 28.4 |
| Scalpel with blades | 139 | 27.4 |
| Sterilizer | 131 | 25.8 |
| Epi pen | 99 | 19.5 |
| Oropharyngeal airway | 72 | 14.2 |
| Automated External Defibrillator | 0 | 0 |

[a] *Not mutually exclusive*

**Appendix B.** Correlation analyses

**B.1.** Correlation analysis of continuous variables and self-efficacy

| Numerical Variable | Spearman's coefficient (ρ) | *p*-value |
|---|---|---|
| Experienced Medical Emergencies | 0.05 | 0.277 |
| Age | 0.19 | <0.001 |
| Years of Experience | 0.15 | <0.001 |

**B.2.** Correlation analysis of categorical variables and self-efficacy

| Categorical Variable | Eta coefficient | *p*-value |
|---|---|---|
| Has First Aid Training | 0.18 | <0.001 |
| Has CPR/BLS Training | 0.41 | <0.001 |
| Sex | <0.01 | 0.101 |
| Education | 0.38 | <0.001 |
| Position | 0.26 | <0.001 |

**B.3.** Correlation analysis of continuous variables and collective efficacy

| Numerical Variable | Spearman's coefficient (ρ) | *p*-value |
|---|---|---|
| Number of Equipment | 0.40 | <0.001 |
| Years of Operation | 0.21 | <0.001 |
| Experienced Medical Emergencies | 0.01 | 0.752 |
| Number of Pharmacy assistants and Technicians | 0.39 | <0.001 |
| Number of Registered Pharmacists | 0.60 | <0.001 |

**B.4.** Correlation analysis of categorical variables and collective efficacy

| Categorical Variable | Eta coefficient | *p*-value |
|---|---|---|
| Type of Pharmacy | 0.04 | <0.001 |
| Has First Aid Training | 0.29 | <0.001 |
| Has CPR/BLS Training | 0.28 | <0.001 |