

Basic Life Support Competency Among Residents of River Communities

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ABSTRACT

Basic Life Support (BLS) is a critical intervention in emergency situations, and its effectiveness largely depends on public awareness and competence. This study aimed to assess BLS competency among residents of selected river communities in Cabanatuan City, focusing on their knowledge, attitudes, and practices (KAP) related to BLS. A total of 404 respondents were selected through purposive simple random sampling. Data were gathered using a validated 30-item survey instrument and analyzed using descriptive statistics and Spearman's rho to identify relationships between demographic variables and KAP scores. Findings indicated that respondents were somewhat knowledgeable about BLS, demonstrated positive attitudes, but showed low levels of practical application. Statistical analysis showed weak but significant correlations between educational attainment and both knowledge and attitude, as well as between age and attitude. No significant association was found between demographic variables and practice. The results highlight the need for targeted BLS training across varying age groups and educational attainment. Strengthening BLS competency at the community level may improve responsiveness and survival rates in high-risk areas such as river communities. To support this initiative, a user-friendly Filipino-language mobile app was developed to guide residents step-by-step during emergencies.

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1. INTRODUCTION

Basic Life Support (BLS) is a critical skill that enables individuals to respond appropriately to emergency situations such as cardiac arrest, choking, and drowning. Records from the World Health Organization (2024) show that drowning accounts for over 236,000 deaths reported worldwide every year, making it still a major public health concern as one of the leading causes of accidental deaths (WHO, 2024). Furthermore, another major cause of death is sudden cardiac arrest, with more than 350,000 individuals in the United States alone experiencing out-of-hospital cardiac arrests annually (American Heart Association, 2021). American Red Cross (2024) emphasizes that early and effective BLS intervention can significantly improve survival rates in both scenarios, stating that

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giving immediate cardiopulmonary resuscitation (CPR) can in fact double or triple a victim's likelihood of survival, especially when bystanders choose to take action.

Numerous projects globally show the value and importance of BLS training. In Asia, tailored community programs in Indonesia and India have demonstrated how culturally adaptive and localized BLS training reduces prehospital mortality and improves skill retention (Sulistiyaning & Setianto, 2020). In the Philippines, although BLS training is usually incorporated into disaster risk reduction projects, it targets particular individuals only such as barangay officials and health workers. For example, training activities in Camalig, Albay by the local disaster office were focused mainly on barangay health workers and nutrition students, whereas in Naga City, the "Community First Responders Training" was intended to train one family representative each in emergency skills, including BLS. Although it is assumed that these trained responders will share their knowledge, there is still an issue with efficiently disseminating knowledge due to time and resource constraints.

This issue is particularly concerning in disaster-prone areas like Cabanatuan City, Nueva Ecija, which experiences frequent flooding and water-related emergencies (Subia et al., 2019). The city's vulnerability is increased due to its geographic location having multiple barangays located near the Pampanga River, Cabu River, Sapang Buhay Creek, and other waterways. In 2023, the Cabanatuan City Disaster Risk Reduction and Management Office (CDRRMO) recorded three drowning incidents, with an additional four incidents reported in 2024. While existing local studies have highlighted the importance of BLS training, most of them overlook its sustainability in high-risk barangays, as their focus is mainly on healthcare workers and institutions alone. With this, this study focused on evaluating the competence of residents in BLS in terms of knowledge, attitude and practice. Moreover, it aimed to address the gap surrounding the implementation of BLS in community settings.

2. RESEARCH METHOD

This study utilized a quantitative-correlational research design to assess Basic Life Support (BLS) competency among residents of selected river communities in Cabanatuan City. This approach allowed for the collection of numerical data through structured surveys, enabling statistical analysis of BLS competency levels and examination of the relationships between demographic factors (age, sex, and educational attainment) and participants' knowledge, attitudes, and practices scores without manipulating any variables (Ghanad, 2023).

The study was conducted in four barangays: San Josef Sur, Santa Arcadia, Sumacab Norte, and Balite. These areas were chosen because the CDRRMO identified them as high-risk communities along the Pampanga River and Sapang Buhay Creek, where the four drowning incidents occurred between January 1 and November 28, 2024. The study population consisted of residents who had lived in the community for at least six months, were of legal age, high school graduates, and willing to participate. A two-stage sampling process was applied. First, using purposive sampling, eligible individuals were selected based on inclusion criteria. Then, from this eligible pool, simple random sampling was employed to provide equal chances of selection and reduce sampling bias. The Raosoft Sample Size Calculator determined a minimum sample size of 378 based on a population of 20,712, a 5% margin of error, 95% confidence level, and 50% response distribution. Across the four barangays, 404 questionnaires were administered in total.

This questionnaire consisted of four parts: demographic profile, and items measuring BLS knowledge, attitudes, and practices. It was validated by five experts and pilot-tested with 20 participants, resulting in a Cronbach's alpha above 0.80, indicating good reliability. Descriptive statistics (frequency, percentage, mean, and standard deviation) were utilized to summarize the responses. Since the data were derived from Likert-scale responses, which are ordinal in nature and do not meet the assumption of normal distribution, Spearman's rho was applied to determine the correlations between demographic variables and BLS competency levels.

3. RESULT AND DISCUSSION

3.1 Distribution of Respondents' Age, Sex, and Educational Attainment

Table 1. Frequency and Percentage Distribution of Respondents' Age, Sex, and Educational Attainment

Age	Frequency	Percent
18-24	50	12.38
25-34	60	14.85
35-44	110	27.23
45-54	105	25.99
55+	79	19.55
Sex	Frequency	Percent
Female	247	61.14
Male	157	38.86
Educational Attainment	Frequency	Percent
High School Graduate	297	73.51

Age	Frequency	Percent
College/University Graduate	107	26.49
Total	404	100.00

Based on Table 1, the largest age group is 35-44 years old, comprising 110 individuals (27.23%) of the total 404 respondents, while the youngest group, 18-24 years old, has the least number of respondents at 50 (12.38%). The data suggests that among all age groups, individuals aged 35-44 years stand out as highly visible and active members of the community. This age group is often characterized by personal and professional stability, with many individuals already raising families and engaged in long-term employment. For instance, Hong et al. (2023) found that age-friendly interventions, often centered around civic involvement and community partnerships, rely heavily on the active participation of middle-aged adults who bring established networks, responsibilities, and a sense of communal belonging to these efforts. Additionally, Dehi Aroogh and Mohammadi Shahboulaghi (2020) explained that middle-aged adults frequently join local programs because of their established networks and civic involvement. On the other hand, participation among 18 to 24-year-olds was noticeably lower. This may be due to their limited exposure to real-life emergencies, which reduces perceived urgency to learn BLS. McCabe et al. (2022) noted that young adults often face academic pressures and job instability, which hinder their ability to engage in community programs. Felicilda-Reynaldo (2021) observed that while Filipino college students are open to health initiatives, factors like time constraints and lack of awareness often prevent active participation. Mokhiber (2024) reported that Gen Z faces increasing disconnection from school and work, driven by mental health issues and economic instability, further limiting their involvement in civic and health-related efforts.

On the other hand, it was found that the majority of respondents (247) or 61.14% were female while 157 or 38.86% of the total were male. The higher proportion of female respondents in this study may be explained by their greater presence and availability in the home and community, making them more likely to participate in local programs and surveys. Women often remain at home during the day while their spouses work and children attend school, thus allowing them to be more approachable for community engagement and frequently selected for roles such as barangay health workers. Octivino and Faller (2024) reported that 90.6% of their respondents in a CPR confidence study involving health workers in Metro Manila were female, suggesting a similar trend. Abiera (2024) noted that in traditional Filipino households, men are typically tasked with financial responsibilities, while women stay home, making them more accessible for health-related initiatives. Santos and Carandang (2021) found that most BHWs in Muntinlupa City were women due to their consistent availability. Reyes and Cruz (2023) further emphasized that women's nurturing qualities and ability to handle situations with calmness and care make them ideal for community health roles, including participation in BLS programs.

According to the survey, 297 people, or 73.51% have only completed high school, while 107 people, or 26.49%, have attended college or university. The study specifically targeted individuals with at least a high school diploma, as BLS training requires a basic understanding of health concepts typically gained through formal education. The World Health Organization (2024) emphasizes that comprehension of emergency medical instructions is essential for effective response. During house-to-house data collection, it was observed that college graduates were often unavailable, likely due to work commitments, a trend supported by the Philippine Statistics Authority (2020), which reports higher employment in the formal sector among individuals with higher education. In contrast, high school graduates were more often available, as many held flexible jobs like tricycle driving, vending, or managing sari-sari stores. According to Garcia and Hernandez (2021), high school graduates can successfully learn and apply BLS techniques when training is adapted to their level. Yugawa (2023) also confirmed that appropriate instructional design plays a key role in BLS knowledge retention, even among those without higher education.

3.2 Knowledge About Basic Life Support

The respondents' level of knowledge regarding BLS is illustrated in the following table:

Table 2. Mean and Standard Deviation for Knowledge Questions

	Mean	SD	Interpretation
1. I am aware that Basic Life Support (BLS) is essential for maintaining blood circulation and oxygenation during emergencies	4.168	1.253	Knowledgeable
2. I am aware that Basic Life Support (BLS) should be initiated immediately for individuals who are unresponsive and have no pulse.	4.052	1.246	Knowledgeable
3. I am aware that effective Basic Life Support (BLS) requires proper knowledge of cardiopulmonary resuscitation (CPR), the use of an Automated External Defibrillator (AED), Bag-Valve-Mask (BVM) and the Foreign Body Airway Obstruction (FBAO) Management.	3.243	1.418	Somewhat Knowledgeable

	Mean	SD	Interpretation
4. I know that the first response when finding someone unresponsive in the middle of the road is to survey the scene to ensure safety of both the rescuer and the patient.	3.421	1.384	Knowledgeable
5. I understand that the proper chest compression technique for adults involves using the heel of the hand and placing it at the center of the chest.	2.948	1.355	Somewhat Knowledgeable
6. I know the recommended depth of chest compression during CPR: at least 2 inches for adults, 1 ½ inches for children, and at least 1 inch for infants.	2.540	1.343	Not Knowledgeable
7. I know that the correct rate of chest compressions in CPR for a single rescuer is 100-120 per minute for both adults and children.	2.475	1.378	Not Knowledgeable
8. I have a clear understanding of the steps involved in assessing responsiveness and breathing in an unresponsive individual.	3.022	1.330	Somewhat Knowledgeable
9. I understand that the first step when finding an unresponsive adult (unwitnessed collapse) is to ensure safety and call for help, such as local emergency responders or barangay health personnel.	3.364	1.417	Somewhat Knowledgeable
10. I know that if a person regains normal breathing pattern and a regular pulse, the correct action is to place them in a recovery position and continue monitoring their condition while waiting for help to arrive.	3.074	1.418	Somewhat Knowledgeable
Overall Mean	3.231	1.354	Somewhat Knowledgeable

The survey data revealed mixed perceptions among respondents regarding Basic Life Support (BLS). A relatively high mean score of 4.168 indicated a strong agreement with the foundational BLS principle that maintaining circulation and breathing during emergencies can save lives. This finding aligns with the American Heart Association (AHA) and European Resuscitation Council (ERC) guidelines, which emphasize early intervention in cases of cardiac arrest, particularly Out-of-Hospital Cardiac Arrest (OHCA). According to Panchal et al. (2020), the prompt recognition of cardiac arrest and immediate initiation of CPR significantly improves survival outcomes. The high level of agreement on this core principle suggests that respondents understand the life-saving potential of BLS at a conceptual level. However, this general awareness contrasts sharply with the respondents' limited knowledge of specific BLS procedures. For example, the item regarding the recommended chest compression rate of 100–120 compressions per minute, the standard for high-quality CPR, received the lowest mean score of 2.475. This is concerning given that proper compression rate is vital for effective circulation during CPR, as current guidelines report. Perkins et al. (2021) emphasized that following the most recent BLS guidelines ensures maximum cardiac output and patient survival. The overall average knowledge score of 3.231, paired with high standard deviations, points to an inconsistent understanding of BLS procedures. This inconsistency reflects a broader issue observed in many communities: theoretical knowledge is present, but procedural accuracy and confidence are lacking (Andersen et al., 2019). To address this, training programs must prioritize simulation-based learning, allowing participants to practice hands-on techniques such as chest compressions using realistic models. Knipe et al. (2020) supported this approach, noting that simulation enhances knowledge retention and builds practical confidence, ultimately improving real-world BLS application and patient outcomes.

3.3 Attitude Towards Basic Life Support

The respondents' attitude towards BLS is presented in the following table:

Table 3. Mean and Standard Deviation for Attitude Questions

	Mean	SD	Interpretation
1. I think Basic Life support is necessary.	4.807	0.464	Strongly Agree
2. I think Basic Life support is life-saving.	4.743	0.604	Strongly Agree
3. I think that Basic Life Support should be included in the school curriculum.	4.673	0.674	Strongly Agree
4. I think all people should be trained in doing BLS.	4.567	0.783	Strongly Agree
5. I am willing to provide Basic Life Support if faced with an emergency.	4.002	1.137	Agree
6. I am willing to perform rescue breathing techniques if I have the proper PPE such as the bag-valve-mask and gloves, if necessary.	3.639	1.207	Agree

	Mean	SD	Interpretation
7. I am willing to assist others in performing Basic Life Support during an emergency if I lack confidence to do it alone.	3.681	1.248	Agree
8. I feel confident in my ability to learn BLS if I receive proper training under supervision.	3.668	1.258	Agree
9. I feel confident that I can remember and follow the steps of BLS in real-life situations after training.	3.594	1.285	Agree
10. I believe I will be able to effectively perform BLS after training.	3.681	1.384	Agree
Overall Mean	4.106	1.004	Agree

The survey findings reveal strong support for Basic Life Support (BLS) as an essential intervention, as shown by the highest mean score of 4.807 for the statement, *"I think Basic Life Support is necessary."* This strong agreement indicates a shared understanding among respondents of BLS as a critical response during emergencies such as drowning, cardiac arrest, respiratory arrest, or airway obstruction. The result highlights a promising opportunity for public health initiatives to leverage this positive perception to promote broader participation in BLS training.

Despite the prevailing positive attitude, the survey data also uncovered a notable gap between theoretical awareness and actual confidence in performing BLS. The statement, *"I feel confident that I can remember and correctly follow the steps of Basic Life Support in real-life situations after training,"* yielded the lowest mean score of 3.594, reflecting uncertainty among respondents regarding their practical capabilities. This discrepancy suggests that while many individuals understand the importance of BLS, they lack the hands-on experience and reinforcement needed to act confidently in real-life emergencies. Mekonnen and Muhye (2020) reported similar findings, indicating that limited access to practical training significantly impairs the ability to perform BLS effectively. Only 20% of their participants had received hands-on training, directly affecting their emergency response readiness. Although the overall attitude mean score of 4.106 is generally favorable, the inconsistencies across specific items suggest that positive sentiment alone does not guarantee preparedness. This concern is echoed by Tadesse et al. (2022), who found that BLS skills tend to decay without continuous practice. Therefore, a multifaceted approach is needed, one that not only reinforces positive perceptions but also ensures continuous and accessible opportunities for hands-on BLS training.

3.4 Practice in Basic Life Support

The following table presents the BLS practices of the respondents:

Table 4. Mean and Standard Deviation for Practice Questions

	Mean	SD	Interpretation
1. I attend Basic Life Support (BLS) training regularly.	1.381	0.754	Never
2. I participate in BLS or community training sessions when available.	1.349	0.851	Never
3. I actively engage in local emergency preparedness programs or first aid training in my community.	1.312	0.760	Never
4. I regularly practice basic life-saving skills like CPR and first aid with my family or community members.	1.273	0.716	Never
5. I participate in simulated emergency drills that involve Basic Life Support procedures.	1.270	0.721	Never
6. I take part in disaster awareness activities in my community that incorporate BLS and CPR training.	1.255	0.699	Never
7. I encounter situations where Cardiopulmonary Resuscitation (CPR) is needed.	1.496	0.931	Never
8. I step in and attempt to provide assistance if someone around me is in need of BLS.	1.431	0.881	Never
9. I apply basic life support (BLS) skills to help someone in my family or community when necessary.	1.354	0.860	Never
10. I perform rescue breaths using proper PPE, such as a bag-valve-mask, when needed.	1.257	0.734	Never
Overall Mean	1.338	0.791	Never

The survey data reveal a consistently low level of engagement in BLS-related activities among respondents. The highest-rated item, "I encounter situations where Cardiopulmonary Resuscitation (CPR) is needed," garnered a mean score of just 1.496, indicating that even the most frequently encountered BLS-related scenario occurs

infrequently. This finding suggests a low incidence of emergency exposure, which may hinder respondents' situational awareness and readiness to act.

In contrast, the lowest-rated statement, "I participate in disaster awareness activities in my community which involve BLS and CPR training," received a mean score of only 1.255, suggesting that participation in community-based preparedness initiatives is nearly absent. This is particularly concerning, as disaster preparedness programs are vital for hands-on skill acquisition and reinforcement of BLS competency. As highlighted by Karanci et al. (2024), community education is designed to empower individuals with both the knowledge and confidence to act during emergencies. The extremely low participation rates suggest that such programs are either inadequately promoted or entirely unavailable, thus missing crucial opportunities to foster community resilience. With the overall mean score for practice falling at 1.338 interpreted as "never", the data underscore a broader deficiency in practical exposure, training frequency, and local engagement. These results echo the findings of Jadidi and Jufaili (2022), who advocate for regular refresher training to retain lifesaving skills and build confidence in emergency response. In light of this, the establishment of accessible and structured BLS training programs that incorporate both theoretical and hands-on components is urgently needed to bridge the identified practice gap.

3.5 Relationship Between Demographic Profile and Knowledge, Attitudes, and Practices in Basic Life Support

The table below illustrates the significant relationship between BLS knowledge, attitudes, and practices

Table 5. Significant Relationship Between Demographic Profile and BLS Knowledge, Attitudes, and Practice

	Spearman's rho	p
Age - Knowledge	-0.074	0.140
Sex - Knowledge	0.036	0.469
Educational Attainment - Knowledge	-0.114*	0.022
	Spearman's rho	p
Age - Attitude	-0.153**	0.002
Sex - Attitude	0.022	0.659
Educational Attainment - Attitude	-0.103*	0.039
	Spearman's rho	p
Age - Practice	-0.079	0.112
Sex - Practice	0.023	0.645
Educational Attainment - Practice	-0.093	0.063

* p < .05, ** p < .01, *** p < .001

The correlation between age and BLS knowledge showed a Spearman's rho of -0.074 and a p-value of 0.140, indicating a weak and statistically insignificant relationship. This means age had little to no effect on BLS knowledge among river community residents. Similar to this finding, Lim and Park (2022) found that procedural skills like CPR are better predicted by the recency of training rather than age itself, as skill retention tends to decline when practice opportunities are limited. This suggests that the frequency of exposure and refresher sessions plays a greater role in maintaining BLS knowledge than the participant's age.

The relation of sex with knowledge of BLS competence turned out to be a Spearman's rho of 0.036 and a p-value of 0.469, representing a very weak positive and not significant correlation ($p > 0.05$). This means that sex cannot be considered a value in defining knowledge of BLS among river community residents. Recent research proves male and females have the same knowledge percentage, provided they do have equal opportunities of accessing training (Adewale, 2025). The study also found that while there were confidence differences between male and female participants, there were no significant differences regarding skill acquisition and retention of practice based on sex.

The analysis yielded a statistically significant value given by Spearman's rho=-0.114, p-value=0.022, defining an inverse weak negative correlation between educational attainment and knowledge. This suggests that higher educational attainment was slightly associated with lower BLS knowledge among river community residents. This counters common assumptions, as it appears general education levels do not guarantee BLS competence. This is supported by Garcia et al. (2023), who argue that BLS knowledge is often acquired through targeted short-term training programs rather than through formal higher education. This highlights the need for specialized community-based training initiatives that reach all educational backgrounds, particularly since higher education may not include emergency response content unless tied to a specific profession.

Regarding the second domain, there is a statistically significant though weak negative correlation between age and attitude. This means that as age increases, attitude tends to decrease, although the relationship is not very strong (indicated by the relatively low absolute value of rho). The p-value (0.002) is less than 0.01, indicating a statistically significant result at the 0.01 level). A study by Chair et al. (2021) investigated public attitudes towards

community first responders in Hong Kong and examined the role of demographic factors such as age. In their study, they found that many people believe that they are unable to learn as they are too old.

There is no statistically significant correlation between sex and attitude. The rho value is very close to zero, and the p-value (0.659) is much greater than 0.05. This suggests that sex does not predict attitude in this sample. This finding aligns with studies where sex differences in attitudes are not consistently observed or are moderated by other variables. For instance, Albadi et al. (2020) observed that while both male and female medical students generally had positive attitudes towards BLS training, they noted some reluctance among female students to perform BLS on strangers, potentially indicating nuances in specific attitudinal dimensions rather than a broad difference in overall attitude.

There is a statistically significant, weak negative correlation between educational attainment and attitude. This means that as educational attainment increases, attitude tends to decrease, but again, the relationship is weak. This weak relationship may be due to individuals with higher educational attainment having more responsibilities, time constraints, or shifting priorities, which may reduce their engagement or interest in BLS training. This finding is supported by a study conducted by Tadesse et al. (2022), which revealed that this may be due to increased responsibilities or time constraints among more advanced students. The study suggested that despite their advanced education, academic workload and clinical duties may limit their opportunity to engage in BLS-related activities.

The Spearman's correlation analysis between age and practice yielded a Spearman's rho of -0.079 with a p-value of 0.112, indicating a weak negative correlation. This suggests that as age increases, BLS practice tends to decrease slightly, but the relationship is not statistically significant ($p > 0.05$). In simpler terms, older respondents were somewhat less likely to engage in BLS-related activities. This finding is consistent with the results of Krammel et al. (2018), who conducted a population-based study in Vienna and found that willingness to perform BLS and use AEDs declined with age. The authors explained that older adults may hesitate to perform CPR due to physical limitations, fear of causing harm, or lack of recent exposure to training. These findings suggest that age-related differences in BLS practice are more related to confidence and physical ability rather than knowledge itself, highlighting the importance of age-sensitive, practical training strategies in communities.

Meanwhile, the correlation between sex and practice showed a very weak, non-significant positive relationship ($\rho = 0.023$, $p = 0.645$), indicating that gender does not meaningfully influence BLS practice. This aligns with Krammel et al. (2018), who observed that although men generally reported higher willingness to perform CPR, gender differences tend to diminish when both sexes receive equal training opportunities. Similarly, Pérez-Rodríguez et al. (2024) emphasized that hands-on, accessible programs such as community drills and gamified BLS training can effectively improve engagement across genders and educational backgrounds. The correlation between educational attainment and practice ($\rho = -0.093$, $p = 0.063$) was also weak and non-significant, suggesting that regardless of education level, the main barrier remains the lack of accessible, continuous, and community-based BLS programs.

4. CONCLUSION

Based on the aforementioned results, it was found that the respondents were generally somewhat knowledgeable about BLS, and though they had positive attitudes towards BLS, their practical application of BLS was notably low. The study also revealed that educational attainment was the most significant demographic factor influencing BLS competency, while age and sex had a lesser impact. Given these findings, it is recommended that targeted interventions be implemented to improve BLS competency, particularly focusing on enhancing practical training and increasing community involvement. One such intervention is the use of the developed mobile application: <https://tinyurl.com/BLS-Mobile-Application> designed to guide users through Basic Life Support procedures in real-time. This app serves as a portable, accessible tool that reinforces learning, encourages hands-on practice, and supports immediate response during emergencies, especially in underserved river communities where formal training may be limited.

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