



# Enhancing Basic First Aid Awareness Among College Students Through a Multimedia-Based Educational Intervention

Francisco III P. Palma 

Jhoan Liezel A. Auditor

Jude Andrei Makilan

Ernesto Jaranilla

Jovin A. Perater

Rose Ann Rivera-Aboso

Johnna Lea Belediano-Ellesorio

Pearl Marie A. Oh

Joy Ann S. Formalejo

Ma. Joselina G. Basa

International Journal of Interdisciplinary Viewpoints (2)8, 67-71, 2026

<https://doi.org/10.64612/ijiv.v2i8.191>

Correspondence: [palmaiiiifrancisco@gmail.com](mailto:palmaiiiifrancisco@gmail.com)

University of Negros Occidental – Recoletos, Philippines

## Abstract

Basic first aid awareness is an important component of health literacy and emergency preparedness because appropriate initial responses may help reduce complications while professional assistance is being obtained. This study examines the effectiveness of a multimedia-based educational intervention in improving basic first aid awareness among college students in a private university in Bacolod City, Negros Occidental, Philippines, during Academic Year 2025–2026. A quantitative one-group pretest–posttest action research design was used with 15 purposively selected college students who demonstrated low baseline awareness. Data were collected using a researcher-developed 45-item Basic First Aid Awareness Questionnaire covering open wounds, closed wounds, and sudden illnesses. The instrument underwent expert content validation and pilot testing, obtaining a Content Validity Ratio of 1.00 and Cronbach's alpha of .902. Participants completed an eight-week multimedia-based intervention involving educational videos, digital images, infographics, and contextualized classroom presentations delivered three times weekly. Descriptive statistics and the Wilcoxon signed-rank test were used to analyze the data. Mean awareness increased from 1.963 (SD = 0.153) before the intervention to 4.167 (SD = 0.162) after the intervention. The Wilcoxon signed-rank test indicated a statistically significant difference between pretest and posttest scores,  $z = -3.41$ ,  $p < .001$ . The findings indicate substantial improvement in measured first aid awareness following the intervention. Given the absence of a control group and the small purposive sample, the findings should be interpreted as preliminary evidence of intervention-associated improvement. Higher education institutions may consider integrating structured multimedia resources into first aid and health education programs, while future studies should use larger samples and controlled designs.

## Keywords

first aid awareness, multimedia education, college students, health education, emergency preparedness

## How to Cite

Palma, F. P., Auditor, J. L. A., Makilan, J. A. J., Jaranilla, E., Perater, J. A., Rivera-Aboso, R. A., Belediano-Ellesorio, J. L. B., Oh, P. M. A., Formalejo, J. A. S., & Basa, M. J. G. (2026). Enhancing basic first aid awareness among college students through a multimedia-based educational intervention. *International Journal of Interdisciplinary Viewpoints*, 2(8), 67–71. <https://doi.org/10.64612/ijiv.v2i8.191>

Received: 26 June 2026

Accepted: 28 July 2026

Published: 30 August 2026

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## Peer Review Statement

This article underwent a double-anonymous peer review process in accordance with the editorial policies of the *International Journal of Interdisciplinary Viewpoints*. Both authors and reviewers remained anonymous throughout the review process.

## Open Access Statement

The *International Journal of Interdisciplinary Viewpoints* is a fully open-access, peer-reviewed journal. All articles are freely available online immediately upon publication without subscription or access fees.

## Funding Statement

The authors received no financial support for the research, authorship, and/or publication of this article.

## Conflict of Interest

The authors declared no conflicts of interest.

## Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

## Author Contributions

The authors contributed to conceptualization, methodology, investigation, writing—original draft preparation, writing—review and editing, and supervision. The authors approved the final manuscript.

## Ethics Statement

This study was conducted in accordance with ethical standards.

## INTRODUCTION

Basic first aid awareness is an important part of health literacy and emergency preparedness because people may encounter injuries or sudden illnesses before professional medical assistance becomes available. Knowing how to respond during the first few minutes of an emergency can help individuals act appropriately while waiting for further assistance. The importance of structured education in preparing people to respond to emergencies is emphasized in international guidance, including the European Resuscitation Council Guidelines (Greif et al., 2021), while broader patient-safety initiatives also recognize the importance of preventing avoidable harm (World Health Organization, 2021). Research across different populations shows that first aid knowledge is not uniform. García-Blaya et al. (2025) reported differences in first aid knowledge across educational stages, while studies involving school educators, parents, and the general public have identified continuing gaps in first aid knowledge, attitudes, and practices (Abdelrahman et al., 2024; Abelairas-Gómez et al., 2020; Alotaibi et al., 2025; Bashekah et al., 2023). These findings suggest that first aid education remains relevant not only for health professionals but also for individuals who may be called upon to respond to emergencies in everyday settings.

College students are a particularly relevant population for first aid education because they encounter a range of academic, residential, recreational, and community situations in which basic emergency knowledge may be needed. Recent evidence from China indicates that university students continue to demonstrate varying levels of knowledge, attitudes, and practices regarding basic first aid skills (Li et al., 2026). Educational experiences that involve university students have also demonstrated the potential of structured first aid learning to connect classroom knowledge with community application (Ramírez-Torres et al., 2023). At the same time, research on first aid education has increasingly explored approaches that are more interactive and responsive to learners. Luo et al. (2023) examined first aid education from a user-experience perspective, while Farooq et al. (2025) explored personalized and gamified approaches to healthcare and first aid training. Wang et al. (2025) likewise highlighted the importance of appropriate dissemination and training approaches in safety and first aid education. Although mental health first aid and psychological first aid address different forms of emergency support from the physical first aid addressed in the present study, research among undergraduate students and disaster responders also demonstrates the broader use of structured educational approaches for developing first aid-related knowledge and preparedness (Dzemaili et al., 2023; Nair & Meirmanov, 2024). Together, this literature points to the value of accessible and learner-oriented approaches while also highlighting the need to examine how such approaches function in specific educational contexts.

Despite this growing body of evidence, an important contextual and methodological gap remains in relation to multimedia-based physical first aid education among general college students in Philippine higher education. Existing studies have examined first aid knowledge and preparedness among university students, educators, parents, and the general public, as well as technology-supported, personalized, and user-centered approaches to first aid education (Abdelrahman et al., 2024; Alotaibi et al., 2025; Bashekah et al., 2023; Farooq et al., 2025; Li et al., 2026; Luo et al., 2023; Wang et al., 2025). However, the available studies in the present reference pool do not directly examine changes in basic physical first aid awareness following an eight-week multimedia-based classroom intervention among students in a Philippine private-university setting. The Philippine higher-education context is also relevant because student learning experiences and engagement may vary according to instructional conditions and educational environments (Palma, 2026). Thus, there is a need for context-specific evidence on whether a structured combination of educational videos, digital images, infographics, and classroom presentations is associated with changes in students' measured first aid awareness. Addressing this gap can provide preliminary evidence that may inform the design of first aid education within higher education while recognizing that a one-group pretest–posttest design cannot by itself establish a causal effect.

Accordingly, this study examined changes in measured basic first aid awareness following a multimedia-based educational intervention among college students in a private university in Bacolod City, Negros Occidental, Philippines. Specifically, it determines the participants' level of awareness before and after the intervention and examines whether a statistically significant difference exists between their pretest and posttest scores. The study focuses on three areas of basic first aid awareness: open wounds, closed wounds, and sudden illnesses during Academic Year 2025–2026. The study contributes preliminary contextual evidence on the use of multimedia resources in first aid education among college students, particularly within a Philippine private-university setting. At the same time, the findings must be interpreted in light of the study's one-group pretest–posttest design, purposive sampling, small sample size, selection of participants based on low baseline awareness, and reliance on a self-reported awareness questionnaire. These limitations mean that improvement in questionnaire scores should be understood as a change in measured awareness following the intervention rather than definitive evidence that the multimedia intervention alone caused the change or improved students' practical first aid competence.

## METHODOLOGY

### Design

The study employed a quantitative one-group pretest–posttest action research design. This design was selected because the study sought to examine changes in participants' measured first aid awareness following the implementation of an educational intervention within a specific educational setting. The action research orientation is consistent with the practical purpose of examining an instructional intervention and its outcomes within an authentic educational context (Creswell & Creswell, 2017). The design involved measurement before the intervention, implementation of the multimedia-based educational program, and measurement after the intervention. Because the design did not include a comparison or control

group, changes between pretest and posttest cannot be attributed exclusively to the intervention. The findings therefore provide evidence of improvement following the intervention rather than definitive experimental evidence of causality.

### **Sampling**

Purposive sampling was used to select participants who demonstrated relatively low levels of basic first aid awareness. Initially, college sections in the participating private university completed a baseline assessment. The section with the lowest mean awareness score was identified, after which 15 students with the lowest individual scores who voluntarily agreed to participate were selected. Participants were required to be currently enrolled during Academic Year 2025–2026, to have completed the baseline assessment, to demonstrate low awareness based on the assessment, and to provide informed consent. Students who did not complete both the pretest and posttest or who declined participation were excluded. The purposive sampling procedure was appropriate to the action research objective of addressing a specific instructional need within the participating educational context. Nevertheless, the resulting sample limits the generalizability of the findings beyond the study setting.

### **Collection**

Data collection occurred in three phases: pre-intervention assessment, implementation of the intervention, and post-intervention assessment. Prior to implementation, institutional permission was obtained and informed consent was secured from participants. The pretest used the researcher-developed Basic First Aid Awareness Questionnaire. Following the baseline assessment, participants received an eight-week multimedia-based educational intervention. The intervention consisted of short educational videos, digital images, infographics, and contextualized classroom presentations adapted from recognized first aid educational resources. Sessions were delivered three times per week during regular classroom periods.

After completion of the eight-week intervention, participants completed the same questionnaire under standardized conditions. The posttest was used to assess changes in measured first aid awareness.

### **Instrument**

The study used a researcher-developed 45-item Basic First Aid Awareness Questionnaire. The instrument contained three domains: open wounds, closed wounds, and sudden illnesses, with 15 items assigned to each domain. Responses were recorded on a five-point Likert scale ranging from 1 = Very Low Awareness to 5 = Very High Awareness. Prior to administration, experts in Physical Education and health education evaluated the content of the instrument. The reported Content Validity Ratio was 1.00. Pilot testing involving 30 college students who were not part of the main sample produced a Cronbach's alpha coefficient of .902, indicating high internal consistency. The instrument therefore demonstrated strong reported content validity and internal consistency within the procedures used in the study. However, the questionnaire measured self-reported awareness rather than objectively observed first aid performance. Consequently, increases in questionnaire scores should not be interpreted as direct evidence of improved practical first aid skill.

### **Analysis**

Data were analyzed using JASP. Descriptive statistics, specifically the mean and standard deviation, were used to summarize participants' awareness scores before and after the intervention. The Shapiro–Wilk test was conducted as an assessment of distributional characteristics. Given the small sample and paired pretest–posttest structure, the Wilcoxon signed-rank test was used to examine the difference between pretest and posttest scores. Statistical significance was evaluated at  $\alpha = .05$ . The analysis identified whether participants' measured awareness scores differed significantly after the intervention. Because the study did not report an effect-size estimate or confidence interval, these statistics should not be retrospectively fabricated.

### **Ethical Considerations**

Institutional permission was obtained before data collection, and participation was voluntary. Participants received information about the study procedures and provided written informed consent. Confidentiality and anonymity were maintained through coded identifiers, and research records were securely stored and restricted to the research team. Participants were informed that they could withdraw from the study without academic or personal consequences. The collected information was used for research purposes only.

### **Limitations and Rigor**

Several limitations should be considered when interpreting the findings. First, the one-group pretest–posttest design lacks a control or comparison group, preventing strong causal attribution to the intervention. Second, the purposive sample consisted of only 15 students from one private university, limiting external generalizability. Third, the questionnaire measured self-reported awareness rather than directly observed first aid performance, creating the possibility of response bias. Methodological rigor was supported by expert review of the questionnaire, a reported Content Validity Ratio of 1.00, pilot testing with 30 students, strong internal consistency (Cronbach's  $\alpha = .902$ ), standardized pretest and posttest administration, and use of a paired nonparametric statistical procedure appropriate to the study's small sample.

## **RESULTS AND DISCUSSION**

The first objective was to determine the level of basic first aid awareness before and after the multimedia-based educational intervention. Table 1 presents the descriptive results. The participants' measured awareness increased from a low level before the intervention to a high level after the eight-week program. The change represents a substantial improvement in questionnaire scores following exposure to the multimedia-based instructional activities. The relatively small standard deviations at both measurement points also indicate that participants' scores were clustered closely around their respective means.

The observed improvement is consistent with literature demonstrating continuing first aid knowledge needs across different populations and educational contexts. García-Blaya et al. (2025) identified differences in first aid knowledge across

stages of education, while Li et al. (2026) documented the importance of basic first aid knowledge, attitudes, and practices among university students. Findings among educators and members of the general public similarly demonstrate the relevance of structured first aid education and continuing preparedness efforts (Abdelrahman et al., 2024; Bashekah et al., 2023).

The improvement also has relevance to emerging approaches to first aid education. Luo et al. (2023) emphasized user experience in the design of public first aid education, suggesting the importance of learning approaches that are accessible and responsive to learners' needs. Farooq et al. (2025) further demonstrated the application of personalized and gamified approaches to first aid education. The present study extends this line of inquiry by examining a multimedia-based intervention delivered through classroom instruction to college students. The findings may be interpreted as evidence that the intervention was associated with improved measured awareness. However, the study design does not establish whether multimedia instruction itself caused the improvement. Factors such as repeated exposure to the questionnaire, classroom interaction, maturation, instructor influence, or other experiences during the eight-week period could also have contributed to the observed change. Accordingly, the results provide preliminary intervention evidence rather than definitive causal evidence. From a pedagogical perspective, the findings support consideration of multimedia resources as supplementary tools within first aid education. Videos, images, infographics, and contextualized presentations can provide alternative ways of presenting instructional content and may be particularly useful when learners need to visualize emergency situations or procedures. Further studies using comparison groups and objective skill assessments are necessary to determine whether improvements in awareness translate into improved practical first aid performance.

Table 1  
Level of Basic First Aid Awareness Before and After the Multimedia-Based Educational Intervention

| Measurement         | M     | SD    | Interpretation |
|---------------------|-------|-------|----------------|
| Before intervention | 1.963 | 0.153 | Low            |
| After intervention  | 4.167 | 0.162 | High           |

The second objective was to determine whether a statistically significant difference existed between participants' awareness scores before and after the intervention. The Wilcoxon signed-rank test results are presented in Table 2. The Wilcoxon signed-rank test indicated a statistically significant difference between pretest and posttest awareness scores,  $z = -3.41$ ,  $p < .001$ . Thus, the observed post-intervention scores were significantly different from the pre-intervention scores within the participating group. The statistical finding is consistent with the broader literature indicating that first aid education can address knowledge and preparedness needs. Studies involving educators, university students, and other populations have documented the importance of structured first aid education (Abdelrahman et al., 2024; Bashekah et al., 2023; García-Blaya et al., 2025; Li et al., 2026). Neyişci (2024), for example, examined a structured first aid training program for teachers and reported its relevance to emergency-response competencies. Similarly, Ramírez-Torres et al. (2023) described a university-based first aid learning experience that connected student learning with community application.

The present findings also correspond with research exploring technology-supported approaches to first aid education. Luo et al. (2023) examined first aid education through a user-experience design perspective, while Farooq et al. (2025) investigated personalized and gamified first aid education. Together with the current findings, this literature suggests that first aid education can incorporate learner-centered and technology-supported approaches rather than relying exclusively on conventional information delivery. Nevertheless, statistical significance should not be equated with demonstrated causal effectiveness. The absence of a control group means that alternative explanations for the pretest–posttest change cannot be excluded. In addition, the reported analysis does not provide an effect size or confidence interval, limiting conclusions regarding the magnitude and precision of the observed change. Future research should therefore combine inferential significance testing with effect-size estimates, confidence intervals, objective performance assessments, and controlled designs. The findings have practical implications for higher education institutions seeking to strengthen student preparedness. Multimedia resources may be incorporated into general education, health education, student-development programs, or institutional safety initiatives as supplementary learning materials. Such implementation should ideally be accompanied by hands-on demonstrations and skills assessments because awareness scores alone cannot establish competency in performing first aid procedures.

Table 2  
Wilcoxon Signed-Rank Test for Basic First Aid Awareness Before and After the Intervention

| Comparison                    | z     | p      | Interpretation         |
|-------------------------------|-------|--------|------------------------|
| Before vs. after intervention | -3.41 | < .001 | Significant difference |

## Pedagogical Implications

The intervention provided an opportunity to integrate videos, images, infographics, and contextualized classroom presentations into first aid instruction. The reported classroom observations indicated increased participation and interaction during implementation. These observations are relevant to the educational value of designing first aid instruction around accessible and engaging learning experiences, although they should be interpreted as contextual observations rather than independently measured outcomes.

The findings suggest that multimedia resources may complement conventional classroom instruction by providing students with visual representations of first aid situations and procedures. This approach is consistent with emerging work on user-centered first aid education and technology-supported training (Farooq et al., 2025; Luo et al., 2023). Nevertheless, the current study measured awareness rather than practical skill, and therefore the pedagogical implications should remain focused on learning and awareness outcomes rather than claiming demonstrated competence.

## Conclusion and Recommendations

The study concludes that the multimedia-based educational intervention was associated with a substantial improvement in the measured basic first aid awareness of college students. Participants' awareness increased from a low level before the intervention to a high level after the eight-week program, and the Wilcoxon signed-rank test demonstrated a statistically significant difference between pretest and posttest scores. These findings provide preliminary evidence that structured multimedia resources, including educational videos, digital images, infographics, and contextualized classroom presentations, can be incorporated into college-based first aid education to support improvements in students' awareness. The study contributes contextual evidence from a private university in the Philippines to the growing literature on technology-supported approaches to first aid education. However, the findings should be interpreted within the methodological limitations of the study. The one-group pretest–posttest design, small purposively selected sample, single-institution setting, and use of a self-reported awareness questionnaire limit causal inference, generalizability, and conclusions regarding actual first aid performance. The observed improvement therefore demonstrates a significant change in measured awareness following the intervention rather than definitive evidence that the multimedia intervention alone caused the change. Nevertheless, the findings support the continued exploration of multimedia-assisted approaches as supplementary strategies for health education and emergency preparedness among college students, particularly when combined with opportunities for practical demonstration and skills assessment.

Higher education institutions may consider integrating structured multimedia-based first aid education into general education courses, health programs, student-development activities, and institutional safety initiatives. Educational videos, visual demonstrations, infographics, and contextualized digital materials may be used to supplement classroom instruction and provide students with accessible representations of first aid situations and procedures. To strengthen educational outcomes, multimedia instruction should be complemented by hands-on demonstrations, supervised practice, and objective assessment of practical skills rather than relying exclusively on self-reported awareness. Faculty members and health educators may also periodically assess students' first aid knowledge and preparedness to identify areas requiring additional instruction. Future researchers should replicate the study using larger and more diverse samples from multiple higher education institutions and employ quasi-experimental or randomized controlled designs with comparison groups to strengthen causal inference. Subsequent studies should also include objective assessments of practical first aid performance, knowledge retention through follow-up testing, and appropriate effect-size estimates and confidence intervals. Further investigation of technology-supported approaches, including personalized and gamified first aid education, may help determine which instructional features most effectively support knowledge acquisition and practical competence. Such research would provide stronger evidence for the development of sustainable and evidence-based first aid education programs in higher education.

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