

Strengthening School Community Preparedness through FAST Education, Health Literacy, and Stroke Emergency Response Simulation

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ABSTRACT

Stroke outcomes are strongly influenced by how quickly people recognize warning signs and activate emergency care. However, school communities are rarely prepared to respond to a suspected stroke among teachers, staff, families, or visitors. This community service program strengthened school preparedness through an integrated package of FAST education, stroke-related health literacy, guided emergency simulation, and development of a School Emergency Response System. The program was implemented at SMA Negeri 1 Ciamis, West Java, Indonesia, with teachers, student members of the School Health Unit, supervising teachers, and UKS personnel participating. The evaluation used an unmatched pre-post design because anonymous respondent codes were not available. The evaluation included 68 pre-activity and 14 post-activity responses, which were analyzed using Mann-Whitney U tests, Holm correction, and rank-biserial effect sizes. Post-activity scores were higher for stroke knowledge and case recognition (79.0±13.3 vs. 92.3±11.1; adjusted $p=0.02$), health literacy (58.8±19.7 vs. 73.1±13.0; adjusted $p=0.012$), and emergency response readiness (61.5±15.6 vs. 67.9±9.7; adjusted $p=0.036$) after the workshop. The largest practical gain was avoiding oral food, fluids, or medication for a person with a suspected stroke, while uncertainty remained about whether symptoms could be observed for 30-60 minutes. The program suggests that schools can become meaningful community nodes for stroke recognition when concise messages, reflective discussions, simulations, and institutional response procedures are combined. Continued reinforcement, paired follow-up evaluations, and routine UKS simulations are recommended.

Keywords: community empowerment, FAST, health literacy, school preparedness, stroke emergency

Received:
01.07.2026

Revised:
15.07.2026

Accepted:
25.07.2026

Available online:
01.08.2026

Suggested citations:

Rohimah, S., Maryammah, M., Mustopa, A. H., Tonapa, S. I., Cahyani, G., Usmar, D., Azis, A., Rahman, S. M., Hidayati, N. N., Rahma, I. Z., Satriady, K., Nurjanah, N., Nailla, B. M., Rahayu, F., & Pitriyah, S. (2026). *Strengthening school community preparedness through FAST education, health literacy, and stroke emergency response simulation.. International Journal of Community Service*, 5 (2), 690-702. DOI: 10.55299/ijcs.v5i2.2044

INTRODUCTION

Stroke remains one of the most consequential global health conditions because it combines high mortality, substantial long-term disability, and a growing absolute burden across many regions, including Southeast Asia (GBD 2021 Stroke Risk Factor Collaborators, 2024; Feigin et al., 2025).

The clinical value of modern reperfusion and stroke unit care depends not only on hospital capability but also on early symptom recognition, accurate recording of the last-known-well time, and immediate activation of emergency pathways before hospital arrival (Phipps & Cronin, 2020; Prabhakaran et al., 2026).

FAST translates this urgency into a memorable public message by linking facial asymmetry, arm weakness, speech difficulty, and time-sensitive action, although community members may remember the symptoms more readily than the required emergency response (Tsakpounidou et al., 2021; van der Merwe et al., 2023).

Therefore, health literacy is more than the possession of factual knowledge because people must be able to access, understand, appraise, and apply information in stressful and time-critical situations (Sørensen et al., 2012; Nutbeam & Lloyd, 2021).

The World Health Organization recommends context-sensitive health literacy development that builds individual capabilities while making organizations and services easier to navigate (World Health Organization, 2022).

Schools offer a distinctive setting for this work because they bring together students, teachers, staff, families, and community networks within an institution that already has educational, communication, and first response functions (Wormack et al., 2019; Orologa et al., 2025).

International school-based initiatives have shown that children and educators can learn stroke warning signs and transfer those messages to parents and grandparents, thereby extending the influence of classroom activities beyond the school gate (Tsakpounidou et al., 2022; Baskini et al., 2023; Orologa et al., 2024).

Interactive and student-centered activities may be particularly valuable because motivation, manageable cognitive load, and opportunities to rehearse actions support performance better than passive information delivery alone (Imeh-Nathaniel et al., 2024).

In Ciamis Regency, local teacher risk profile data had previously identified a meaningful need for stroke prevention and preparedness, which encouraged the nursing program and partner school to move from awareness raising toward a practical school response system (Universitas Galuh Community Service Team, 2026a).

The partner community included teachers, student members of the School Health Unit (Usaha Kesehatan Sekolah/UKS), supervising teachers, and the staff responsible for UKS, because each group may become part of the first chain of recognition, communication, and safe assistance during a school emergency (Universitas Galuh Community Service Team, 2026a).

Therefore the service team integrated FAST education, health-literacy strengthening, guided simulation, educational media, and a School Emergency Response System SOP rather than treating stroke education as a single lecture (Universitas Galuh Community Service Team, 2026a).

This article describes the implementation and immediate community outcomes of the program, with particular attention to changes in knowledge, stroke-related health literacy, and readiness to respond safely and promptly in the school setting (Universitas Galuh Community Service Team 2026b).

METHOD

Community partner, participants, and setting

The community service activity was implemented with SMA Negeri 1 Ciamis in Ciamis Regency, West Java, Indonesia, from 1 July to 17 July 2026 (Universitas Galuh Community Service Team, 2026a).

The intended participants were teachers, students who were members of UKS, UKS supervising teachers, and personnel responsible for UKS coordination, reflecting the partner school's need for a shared rather than an individual emergency response (Universitas Galuh Community Service Team, 2026a).

Participation in the questionnaire was voluntary, and respondents received information about the purpose of the evaluation before indicating their consent (Universitas Galuh Community Service Team, 2026a).

The service was facilitated by lecturers and nursing students from the Faculty of Health Sciences, Universitas Galuh, as a Project-Based Learning and community engagement activity in Emergency Nursing (Universitas Galuh Community Service Team, 2026a).

Program design and educational pathway

The program combined community education, participatory training, simulation, and institutional assistance, which are consistent with the community-service orientation required by IJCS (International Journal of Community Service, 2025).

The educational package addressed FAST recognition, the broader possibility of sudden balance or visual disturbance, the importance of recording symptom onset or last-known-well time, immediate activation of medical assistance, safe positioning and supervision, avoidance of oral food or medication, and concise communication during referral (Prabhakaran et al., 2026; Universitas Galuh Community Service Team, 2026a).

Health literacy activities ask participants to identify trustworthy information sources, understand response instructions, distinguish accurate advice from myths, and apply information to decision making (Sørensen et al., 2012; World Health Organization, 2022).

The simulation used a suspected stroke scenario to allow participants to rehearse facial, arm, and speech checks; record time; activate help; protect the person from unsafe actions; and communicate signs, time, condition, and location to health personnel (Universitas Galuh Community Service Team, 2026a).

The program concluded with a reflection and the handover of a School Emergency Response System SOP, flowchart, communication-referral pathway, and educational media to support continuity within UKS (Universitas Galuh Community Service Team, 2026a).

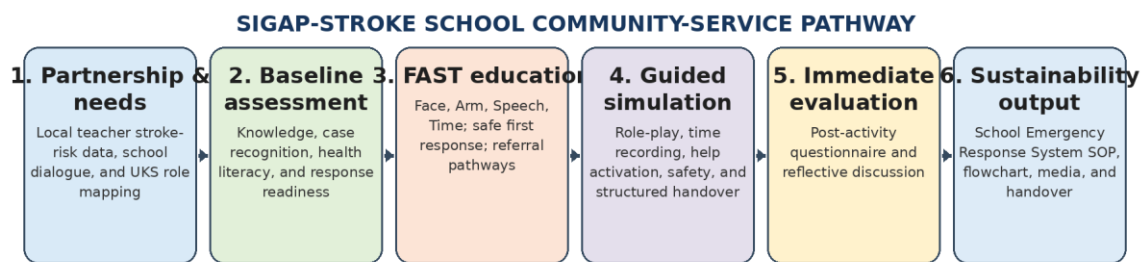


Figure 1. Community-service pathway for strengthening stroke preparedness in the partner school

Source: Developed from the SIGAP-STROKE SCHOOL program records (Universitas Galuh Community Service Team, 2026a).

Evaluation instrument and scoring

The KEF-FAST-SCHOOL questionnaire assesses eight knowledge statements, four case vignettes, stroke-related health literacy, rapid response readiness, and a post-activity media evaluation section (Universitas Galuh Community Service Team, 2026a).

Knowledge and case recognition were scored from 0 to 12 and converted to a 0-100 scale, with incorrect and 'do not know' responses scored as zero (Universitas Galuh Community Service Team, 2026a).

The uploaded response file contained seven of the eight intended health literacy items therefore the available scale was standardized using $(\text{observed score} - 7) / (28 - 7) \times 100$ rather than the original eight-item formula (Universitas Galuh Community Service Team, 2026b).

Rapid response readiness comprised eight four-point items and was standardized using $(\text{observed score} - 8) / (32 - 8) \times 100$ (Universitas Galuh Community Service Team, 2026a).

The instrument was treated as a program evaluation tool rather than a standardized psychometric measure because content validation, readability testing, and larger-sample construct evaluation remain necessary (Universitas Galuh Community Service Team, 2026a).

Evaluation design and analysis

Pre-activity responses were defined by timestamps from July 14 2026 through July 16 2026 at 13:54:45, whereas post-activity responses began on July 16 2026 at 15:13:09 (Universitas Galuh Community Service Team, 2026b).

The evaluation dataset comprised 68 pre-activity and 14 post-activity responses (Universitas Galuh Community Service Team, 2026b).

Anonymous respondent identifiers were unavailable therefore the evaluation was analyzed as an unmatched pre-post comparison rather than a paired design (Universitas Galuh Community Service Team, 2026b).

Mann-Whitney U tests were used for the three continuous outcomes, Holm adjustment controlled multiplicity across the primary outcomes, and rank-biserial correlation described the effect magnitude (Universitas Galuh Community Service Team, 2026b).

Item-level changes in correct responses were explored using Fisher's exact test with Holm adjustment across the 12 knowledge and vignette items (Universitas Galuh Community Service Team, 2026b).

The interpretation emphasized practical community service gains and implementation lessons because an unmatched evaluation cannot establish causal effects with the certainty of a controlled trial (Universitas Galuh Community Service Team, 2026b).

Table 1. Program stages, community participation, and intended outputs

Stage	Main activity	Participant role	Output
Partnership	Needs discussion and role mapping	School identifies practical gaps and local pathways	Shared program plan
Baseline	Pre-activity questionnaire	Participants reflect on current knowledge and readiness	Initial needs profile
Education	FAST, health literacy, safe action, and referral	Participants ask questions and challenge misconceptions	Shared recognition and action language
Simulation	Scenario-based rehearsal and structured communication	Participants alternate observer, helper, and communicator roles	Practice experience and reflection
Institutionalization	SOP, flowchart, media, and handover	UKS and school leadership receive and contextualize products	School Emergency Response System
Evaluation	Post-activity questionnaire and discussion	Participants identify gains and remaining uncertainty	Immediate program feedback

Source: Universitas Galuh Community Service Team (2026a).

RESULTS AND DISCUSSION

Participation and evaluation profile

The program evaluation included 82 questionnaires, consisting of 68 pre-activity and 14 post-activity responses (Universitas Galuh Community Service Team, 2026b).

The difference in group size and the absence of respondent matching require cautious interpretation because the post-activity group may not represent every person who completed the baseline questionnaire (Universitas Galuh Community Service Team, 2026b).

Table 2. Participant responses included in the program evaluation

Participant group	N	Interpretation
Pre-activity responses	68	Unmatched baseline evaluation group

Participant group	N	Interpretation
Post-activity responses	14	Unmatched immediate post-activity group
Total responses analyzed	82	Questionnaires included in the evaluation

Source: Program evaluation dataset (Universitas Galuh Community Service Team, 2026b).

Knowledge, health literacy, and response readiness

Post-activity scores were higher across all three program outcomes, indicating that the community left the activity with stronger immediate cognitive and perceived response resources (Universitas Galuh Community Service Team 2026b).

Knowledge and case-recognition scores increased from 79.0 ± 13.3 to 92.3 ± 11.1 , with a 13.2-point difference, an adjusted p value of .002, and a large rank-biserial effect of .579 (Universitas Galuh Community Service Team, 2026b).

Stroke-related health literacy increased from 58.8 ± 19.7 to 73.1 ± 13.0 , with a 14.4-point difference, an adjusted p value of .012, and a moderate rank-biserial effect (Universitas Galuh Community Service Team 2026b).

Rapid response readiness increased from 61.5 ± 15.6 to 67.9 ± 9.7 , with a 6.4-point difference, an adjusted p value of .036, and a moderate rank-biserial effect (Universitas Galuh Community Service Team, 2026b).

The health literacy gain was slightly larger in absolute score than the knowledge gain, which supports the program's decision to teach how to use information rather than focusing solely on memorization (Nutbeam & Lloyd, 2021; Universitas Galuh Community Service Team, 2026b).

The smaller readiness gain may reflect that confidence and organizational action depend on repeated practice, clear role allocation, and access to a functioning local referral pathway in addition to one educational encounter (World Health Organization, 2022; Universitas Galuh Community Service Team, 2026b).

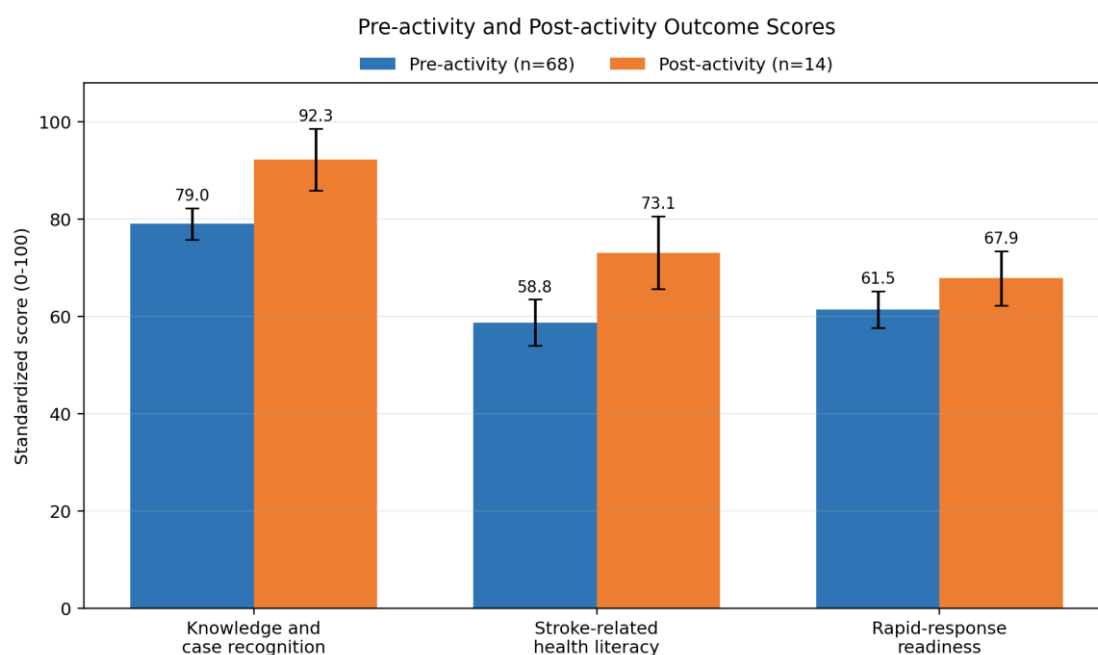


Figure 2. Standardized pre-activity and post-activity scores for the three main outcomes

Source: Program evaluation dataset; error bars indicate 95% confidence intervals (Universitas Galuh Community Service Team, 2026b).

Table 3. Immediate changes in the main program outcomes

Outcome	Pre mean±SD	Post mean±SD	Difference	Holm p	r_rb	Magnitude
Knowledge and case recognition	79.0±13.3	92.3±11.1	+13.2	.002	.579	Large
Stroke-related health literacy	58.8±19.7	73.1±13.0	+14.4	.012	.438	Moderate
Rapid-response readiness	61.5±15.6	67.9±9.7	+6.4	.036	.333	Moderate

Source: Galuh Community Service Team (2026b). r_rb = rank-biserial correlation.

What participants learned most clearly

The most pronounced item-level improvement concerned the safety message that a person with a suspected stroke should not be given food, drink, or oral medication, which increased from 30.9% correct at baseline to 92.9% after the activity (Universitas Galuh Community Service Team, 2026b).

This gain is clinically meaningful because dysphagia can occur in acute stroke and unassessed oral intake may increase the risk of aspiration or delay appropriate care (Prabhakaran et al., 2026).

Understanding of the 'Time' component of FAST increased from 63.2% to 100%, suggesting that the combined explanation and simulation successfully connected symptom recognition with documenting onset and seeking help (Universitas Galuh Community Service Team, 2026b).

This finding is consistent with school-based FAST initiatives in which interactive delivery improves recognition of symptoms and emergency action messages among children and their families (Tsakpounidou et al., 2022; van der Merwe et al., 2023).

Case-vignette performance was already relatively strong at baseline, which may indicate that contextual stories were easier for participants to interpret than isolated true-false statements (Universitas Galuh Community Service Team, 2026b).

Active learning research similarly suggests that realistic and learner-centered tasks can improve attention, relevance, and retention during stroke education (Wormack et al., 2019; Imeh-Nathaniel et al., 2024).

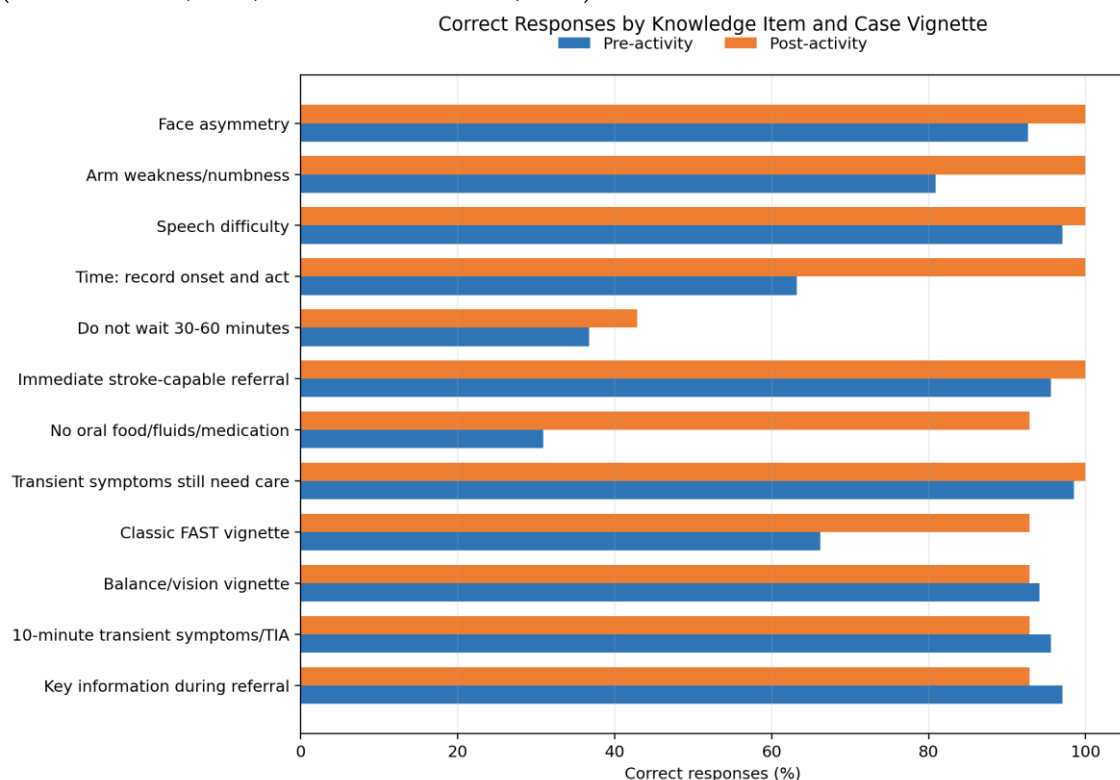


Figure 3. Percentage of correct responses for knowledge statements and stroke case vignettes

Source: Program evaluation dataset (Universitas Galuh Community Service Team, 2026b).

The misconception that still matters

A persistent concern was the statement that stroke symptoms could be observed for 30-60 minutes to see whether they improved, because only 42.9% of the post-activity group rejected this unsafe delay (Universitas Galuh Community Service Team, 2026b).

The results show that remembering FAST signs does not automatically guarantee correct time-critical behavior, particularly when symptoms are mild, fluctuating, or transient (Faiz et al., 2018; Universitas Galuh Community Service Team, 2026b).

Current stroke guidance emphasizes immediate emergency assessment even when symptoms improve, because transient symptoms can represent a transient ischemic attack or evolving cerebrovascular event that requires urgent evaluation (Kleindorfer et al., 2021; Prabhakaran et al., 2026).

Therefore the partner school should repeat a simple behavioral message: do not wait, note the time, activate help, and avoid giving anything by mouth until health professionals assess the person (Prabhakaran et al., 2026; Universitas Galuh Community Service Team, 2026a).

National and international awareness campaigns have shown that repeated exposure is often necessary to retain the link between warning signs and calling emergency services (Nordanstig et al., 2017; Baskini et al., 2023; Orologa et al., 2024).

From individual knowledge to a prepared school

The principal community service contribution was not limited to higher questionnaire scores because the program also helped the school translate health information into roles, communication steps, media, and an institutional SOP (Universitas Galuh Community Service Team, 2026a).

This organizational layer is important because health literacy depends partly on whether institutions provide trustworthy information and make appropriate action pathways understandable and accessible (Nutbeam & Lloyd, 2021; World Health Organization, 2022).

UKS can function as a local preparedness hub by maintaining emergency contacts, displaying FAST reminders, rehearsing safe first-response steps, and supporting communication between school leadership, families, and health services (Universitas Galuh Community Service Team 2026a).

Students should not be positioned as substitute health professionals however they can become observant community members who recognize warning signs, seek an adult, activate the agreed pathway, and communicate a clear FAST message (Orologa et al., 2025; Universitas Galuh Community Service Team, 2026a).

Teachers and supervising staff remain essential because they can authorize emergency action, ensure safety, coordinate communication, and maintain continuity of school procedures (Universitas Galuh Community Service Team, 2026a).

The global FAST Heroes experience supports the broader idea that school-based stroke literacy can move across generations when learners are encouraged to share simple messages with their families (Tsakpounidou et al., 2022; Orologa et al., 2025).

The current program extends this idea by pairing knowledge transfer with a school response structure designed for the Indonesian UKS context (Universitas Galuh Community Service Team, 2026a).

Implementation strengths, limitations, and sustainability

The program's main strengths are its partnership with a real school community, inclusion of several UKS-related roles, combination of education and simulation, and delivery of practical institutional products (Universitas Galuh Community Service Team, 2026a).

The immediate results also showed that targeted misconceptions can change substantially when participants are given a clear rationale and an opportunity to rehearse their responses (Universitas Galuh Community Service Team, 2026b).

Nevertheless, the evaluation had an unmatched design, a small post-activity group, an unusable role variable, one missing health literacy item, and no analyzable observer checklist for simulation performance (Universitas Galuh Community Service Team, 2026b).

Therefore the simulation should be described as an implemented educational component rather than an objectively proven skills outcome in this manuscript (Universitas Galuh Community Service Team, 2026b).

Future cycles should use anonymous codes to pair responses, record participation roles accurately, administer the complete instrument, score simulation performance, and conduct follow-up assessments after two to four weeks (Universitas Galuh Community Service Team, 2026a).

Long-term follow-up is particularly relevant because school-based stroke programs can retain meaningful knowledge over time however retention is not uniform across symptoms and response actions (Baskini et al., 2023; Orologa et al., 2024).

Sustainability depends on brief recurring drills, integration into UKS work plans, visible communication materials, annual review of emergency contacts, and orientation for new teachers and UKS members (Universitas Galuh Community Service Team, 2026a).

CONCLUSION

The SIGAP-STROKE SCHOOL community service program demonstrated that a school can become a practical setting for strengthening stroke recognition, health literacy, and emergency response readiness when education is connected to simulation and institutional procedures (Universitas Galuh Community Service Team, 2026b). Immediate post-activity scores were higher for knowledge, health literacy, and readiness, with the clearest gains in avoiding oral intake and understanding the time component of FAST (Universitas Galuh Community Service Team, 2026b). The remaining uncertainty about waiting 30-60 minutes shows that future reinforcement must prioritize a direct behavioral message that stroke symptoms should never be observed passively while hoping they resolve (Prabhakaran et al., 2026; Universitas Galuh Community Service Team, 2026b). The most sustainable outcome is the shared School Emergency Response System, because it transforms individual learning into a collective pathway involving students, teachers, UKS, school leadership, families, and health services (Nutbeam & Lloyd, 2021; Universitas Galuh Community Service Team, 2026a). Routine simulation, complete paired evaluation, and short-term retention assessment are recommended before the model is expanded to other schools in Ciamis Regency (Baskini et al., 2023; Universitas Galuh Community Service Team, 2026a).

Funding Statement

[This community service program was funded by Universitas Galuh through an internal institutional grant of IDR 20,000,000. Additional in-kind support was provided by MAHSA University, Malaysia, with an estimated value of IDR 20,000,000 and

SMAN 2 Ciamis, with an estimated value of IDR 2,000,000. The in-kind contributions included facilities, human resources, local coordination, participant support, educational materials and logistical assistance. No separate grant number was provided for this study.

Ethical Compliance

The activity was conducted as an educational community service program and program evaluation. Participants received information and provided voluntary consent, and only de-identified aggregate data were reported (Universitas Galuh Community Service Team, 2026a). (No. DP.04.03/F.XXVI.20/KEPK/940/2025).

Data Access Statement

The de-identified data supporting this program evaluation may be made available upon reasonable request to the corresponding author, subject to approval from the partner institution and applicable privacy and ethical requirements (Universitas Galuh Community Service Team, 2026b).

Conflict of Interest Declaration

The authors declare that they have no financial or organizational conflicts of interest related to this program or manuscript.

Acknowledgment

The authors sincerely thank the principal, teachers, students, UKS supervising teachers, and UKS personnel of SMA Negeri 1 Ciamis for their openness, active participation, and commitment to building a safer school community (Universitas Galuh Community Service Team, 2026a).

The authors also acknowledge the nursing students and lecturers of the Faculty of Health Sciences, Universitas Galuh, who developed the educational media, facilitated the simulation, and supported the School Emergency Response System handover (Universitas Galuh Community Service Team, 2026a).

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