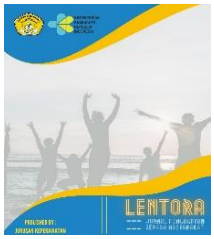

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Empowering Health Cadres in Rural Communities for Heart Attack Prevention and First Aid Response

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ABSTRACT

The prevalence of heart disease cases in Awu Village remains quite high, with 18 cases recorded in the past year alone. Death in cardiac arrest cases can occur because health workers are unable to treat victims in the emergency phase. Appropriate handling measures in handling emergency cases of cardiac arrest are not only health service workers but also lay people, including community health cadres in Awu Village who serve as first responders. Efforts that can be made to address this problem include conducting community service activities in the form of providing education about heart attacks, basic life support training, and training in selecting and processing healthy food ingredients. The purpose of this PkM activity is to increase knowledge about heart disease, improve cadre skills related to basic life support skills, and improve skills in selecting and processing healthy food ingredients. The methods used in this community service activity were lectures and Q&A sessions using PPT media and leaflets, combined with hands-on basic life support practice. A one-day structured training (6 hours) was conducted, including pre- and post-tests to measure knowledge gain. The target of this activity is cadres and the community in Awu Village, North Luwuk District, Banggai Regency, totaling 40 people, which was carried out on July 30, 2025. The results showed an increase in the average knowledge and skills score from 43.50 (pre-test) to 91.00 (post-test) out of a maximum score of 100, indicating a significant improvement ($p < 0.05$). This activity is expected to be a follow-up activity for the Awu village to carry out continuous education by collaborating with the local health center. The output of this PKM activity is the publication of articles in scientific journals, activity videos, online news and IPR leaflets.

INTRODUCTION

Cardiovascular disease remains the number one cause of death worldwide (Fry & Piñeiro, 2023). Data on heart disease in Indonesia remains quite high. According to the 2023 Indonesian Health Survey, the prevalence of heart disease in Indonesia was 877,531, with 9,721 cases in Central Sulawesi Province (SKI, 2023). The prevalence of heart disease in Awu Village was 18 cases.

Heart attacks are a deadly cardiovascular disease (Aniamarta, Salsabilla Huda, & Lizariani Aqsha, 2022). A heart attack is a medical emergency that requires immediate and appropriate treatment to prevent further heart damage (Kurniawan, Ibrahim, & Prawesti, 2015; Suleman, 2023). The mortality rate from heart disease in Indonesia is 31% of the 56.5 million deaths in Indonesia (Milindasari & Juniah, 2022).

Heart disease is caused by various factors. Risk factors for heart disease consist of modifiable and non-modifiable risk factors. Modifiable risk factors include hypertension, hyperlipidemia, diabetes mellitus, obesity, smoking, poor diet, and lifestyle. Non-modifiable risk factors include age, gender, race/ethnicity, and family history of the disease (Ramadhan, 2022). Heart disease is a disease caused by blockage or narrowing of the coronary arteries, due to the process of atherosclerosis that supplies blood flow to the heart, as well as the accumulation of fat in the coronary arteries, thus blocking blood flow to the heart (Bachtiar, Gustaman, & Maywati, 2023). Heart disease is caused by high blood cholesterol due to the behavior of consuming excessive saturated fat, low carbohydrates, and lack of fiber from the daily diet (Nazarena, Mardiana, & Sriwiyanti, 2023). Coronary heart disease sufferers are always characterized by elevated cholesterol levels, a condition often caused by an unhealthy diet (Marlinda, Dafriani, & Irman, 2020; Permatasari & Muhlishoh, 2020).

Death in cardiac arrest can occur because healthcare workers are unable to treat the victim during the emergency phase. Appropriate treatment for cardiac arrest requires not only healthcare workers but also laypeople, including community health workers (Sri Rahmayanti Berutu, Sindy Adella, Zumiati Syarah Br Napitupulu, & Usiono, 2023). Another study found that 1 in 5 adults currently cannot identify any symptoms of a heart attack (Bray et al., 2023). Basic Life Support (BLS) is the appropriate treatment for cardiac arrest emergencies. All levels of society should have skills in BHD (Ihsani & Diyananda, 2023; Ukkasah et al., 2024). Basic Life Support (BLS) is a first aid measure performed on victims of cardiac and respiratory arrest. Rapid and appropriate treatment is necessary for patients with emergency conditions in hospitals and outside hospitals (Ana & Kusyani, 2023). Education regarding the assessment of signs and symptoms of heart attacks is important, especially for high-risk communities (Cantisano et al., 2023). In addition, education about consuming vegetables and fruit can be the best option to increase knowledge and motivate the community to adopt healthy eating patterns to avoid heart disease (Wiyati, Nurhasna, & Hikmawantia, 2023).

Despite the high prevalence of heart disease in Awu Village (18 cases), preliminary observations indicate that local cadres lack adequate knowledge and practical skills in recognizing heart attack symptoms, performing basic life support (BLS), and advising on heart-healthy nutrition. This gap between community need and cadre capacity forms the primary rationale for this community service activity.

Furthermore, no previous research has specifically assessed the readiness of community cadres in Awu Village. A preliminary survey conducted by the team found that 85% of cadres could not correctly identify heart attack symptoms, and none had received formal BLS training in the past three years.

Therefore, this community service activity aims to: (1) increase cadre knowledge about heart attack recognition and prevention; (2) improve cadre skills in basic life support; and (3) enhance cadre abilities in selecting and processing healthy foods. By empowering cadres as first-line responders, this activity seeks to reduce mortality and improve emergency preparedness in Awu Village.

IMPLEMENTATION METHOD

This community service activity used a one-group pre-test post-test design to evaluate changes in cadre knowledge and skills. The activity was carried out over 6 months from February to July 2025 in Awu Village, North Luwuk District, Banggai Regency. The target audience was 40 cadres and community members. The activity began with coordination with partners to discuss the activities to be carried out so that they were in line with the partner program and then conducted a quantitative assessment of the level of understanding of cadres and the community in Awu Village by distributing questionnaires before heart health education and basic life support practices were carried out. The questionnaire consisted of 20 multiple-choice questions assessing knowledge of heart attack symptoms (5 items), risk factors (5 items), prevention strategies (5 items), and basic life support procedures (5 items). The instrument was developed based on literature review and validated by two experts in cardiovascular nursing and community health. A pilot test on 10 non-participant cadres yielded a Cronbach's alpha of 0.87, indicating good reliability. After the data was collected, it was continued with heart health education and basic life support practices. The assessment of this activity will be carried out after the heart health education and basic life support practices were provided. The heart health education session lasted 120 minutes, delivered via lecture, PowerPoint slides, and leaflets, covering heart attack pathophysiology, risk factors, symptom recognition, and emergency response steps.

The BLS training session lasted 180 minutes and included: (1) a 30-minute demonstration of chest compressions, rescue breaths, and AED use using a Resusci Anne manikin; (2) 120 minutes of hands-on practice with a 1:5 instructor-to-participant ratio; and (3) a 30-minute skills assessment. Instructors were certified BLS providers with at least 2 years of teaching experience. Training on healthy food selection and processing was conducted separately over 90 minutes, including interactive sorting games and cooking demonstrations using locally available ingredients. The criteria and indicators for success were: (1) a minimum 30% increase in mean knowledge score from pre-test to post-test; (2) at least 80% of participants achieving a post-test score of ≥70; (3) 100% of participants demonstrating correct chest compression depth (5–6 cm) and rate (100–120/min) on the manikin; and (4) at least 85% of participants passing checking responsiveness, calling for help, proper hand placement, compression-to-ventilation ratio). Data were analyzed using paired t-tests with significance set at $p < 0.05$.

RESULTS AND DISCUSSION

The community service activity in Awu Village, North Luwuk District, Banggai Regency, went smoothly and reached the target participants as planned. A questionnaire was used to assess the participants' knowledge and skills regarding the material before (pre-test) and after (post-test) the presentation and basic life support training. The following are the results of the activity :

Table 1. Distribution of average pre-test and post-test scores

	Average	**Median (Minimum – Maksimum)**
Skor Pre test	43,50	40 (0 – 60)
Skor Post test	91,00	100 (80 – 100)

A paired t-test was conducted to compare pre-test and post-test scores. The mean pre-test score was 43.50 (SD = 12.4), and the mean post-test score was 91.00 (SD = 6.8). The mean difference was 47.50 (95% CI: 42.1 to 52.9). This difference was statistically significant ($t(39) = 18.64$, $p < 0.05$), indicating that the intervention effectively improved participant knowledge and skills.

A total of 40 participants attended this community service activity, consisting of 10 health cadres and 30 Awu village residents. Participant engagement was high, as evidenced by: (1) 100% attendance throughout the full 6-hour session; (2) an average of 12 questions asked per session during the Q&A period; (3) 38 out of 40 participants (95%) successfully completing all BLS practice stations; and (4) a post-activity satisfaction survey showing that 92.5% of participants rated the training as "very useful" or "extremely useful.

Figures 1 and 2 Implementation of Community Service Activities

Based on the analysis of respondents' answers during the pre-test, the average score was 43.50. This low average pre-test score indicates that the knowledge and skills of health cadres and the Awu village community are still limited. Many participants were unfamiliar with the signs of a heart attack, the preparation of heart-healthy foods, and the appropriate actions to take if they encounter a person experiencing a heart attack.

The average post-test score of 91.00 represents a significant improvement compared to the average pre-test score, with an average score increase of 47.50 points. This demonstrates that the education and training methods provided effectively transformed the participants' knowledge and skills. The observed 47.50-point increase is comparable to findings by Minardo et al. (2024), who reported a 42-point improvement following BLS training in rural communities, and Putri & Jamna (2019), who found a 38-point gain using demonstration methods. However, the current study's final mean score (91.00) is higher than both previous studies (85.00 and 82.00, respectively), possibly due to the combination of three integrated interventions (heart health education, BLS training, and nutrition training) rather than a single intervention.

This activity aims to empower the community, particularly health cadres, by equipping them with adequate knowledge and skills related to heart attacks, selecting and preparing heart-healthy foods, and providing basic life support for heart patients. This is in line with the goal of community service to increase the community's capacity to address health problems independently.

Several limitations should be acknowledged. First, the absence of a control group means we cannot definitively attribute the knowledge gain solely to the intervention rather than to testing effects or other concurrent factors. Second, the post-test was administered immediately after training, leaving long-term knowledge

retention unmeasured. Third, self-reported enthusiasm may be subject to social desirability bias. Fourth, the sample was limited to one village (n=40), which may limit generalizability to other settings. Future community service activities should include delayed post-tests (e.g., 3 months later) and expand to multiple villages to strengthen evidence of sustained impact.

CONCLUSIONS AND SUGGESTIONS

This community service activity, which included training to empower cadres in heart attack prevention and first aid, successfully improved participant knowledge and skills, as evidenced by a significant increase in mean scores from 43.50 (pre-test) to 91.00 (post-test) ($p < 0.005$). All four predetermined success criteria were achieved: (1) a 47.50-point increase exceeded the 30% target; (2) 100% of participants (40/40) achieved post-test scores ≥70, surpassing the 80% target; (3) 100% of participants demonstrated correct chest compression depth and rate; and (4) 90% (36/40) passed the BLS skills checklist, exceeding the 85% target. Based on these findings, the following suggestions are proposed: (1) For the Awu Village health center: conduct refresher BLS training every 6 months to maintain cadre skills; (2) For the Banggai Regency Health Office: allocate funds for BLS manikins and training materials to support regular cadre upskilling; (3) For the village government: integrate heart health education into monthly village meetings (posyandu) and establish a rapid-response team of trained cadres on a rotating weekly schedule; (4) For future researchers: conduct a 3-month and 6-month follow-up to assess long-term knowledge retention and real-world application of BLS skills.

Given the success of this model, replication is recommended in other villages within North Luwuk District and across Banggai Regency, adapting the training materials to local languages and cultural contexts while maintaining the core three-component intervention (heart health education, BLS practice, and healthy food training).

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