

Community Partnership Program for the Prevention of Cardiovascular Disease and Diabetes Mellitus in Galung Maloang Village, Bacukiki District, Parepare City, South Sulawesi, Indonesia

Agussalim^{1*}, Syarifuddin¹, Saleng M¹, Suprapti S²

¹Parepare School of Nursing, Makassar Health Polytechnic, Indonesia

²Mamuju School of Nursing, Mamuju Health Polytechnic, Indonesia

ABSTRACT

Background: Non-communicable diseases (NCDs), particularly cardiovascular disease (CVD) and diabetes mellitus (DM), are the leading causes of morbidity and mortality globally. Indonesia is experiencing a rising trend in degenerative diseases, reflected in the increasing prevalence of obesity, hypertension, chronic kidney disease, and diabetes. In Parepare City, South Sulawesi, local health data revealed a considerable burden of CVD and DM, requiring urgent preventive interventions.

Objective: This study reports the implementation and outcomes of a community service program aimed at improving knowledge, early detection, and preventive practices against CVD and DM in Galung Maloang Village, Bacukiki District, Parepare City.

Methods: A participatory action approach was employed from March to June 2025, involving community members, local health cadres, and the Lompoe Health Center. Activities included five health education sessions, screening for blood glucose, blood pressure, and body mass index, distribution of educational leaflets, and the establishment of a digital communication network (WhatsApp group) linking residents, cadres, and health workers. Pre- and post-test questionnaires were used to assess knowledge improvement. Data were analyzed descriptively.

Results: A total of 215 residents participated in the program. Knowledge scores improved significantly, from 53% (pre-test) to 87% (post-test), indicating adequate understanding of CVD and DM risk factors and prevention. Screening identified 32 residents (14.9%) with pre-diabetes, 18 (8.4%) with early-stage hypertension, and 7 (3.2%) with obesity. A digital network was formed with 180 active members, strengthening communication with the health center. A pocketbook on CVD and DM prevention was drafted and distributed to local stakeholders.

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*Corresponding Author

Dr. Agussalim MSN,

Parepare School of Nursing, Makassar Health Polytechnic, Indonesia, Email: salim170878@gmail.com

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Conclusion: The community partnership program successfully enhanced public awareness, improved early detection, and strengthened local health networks for NCD prevention in Galung Maloang Village. This model demonstrates the potential of collaborative, family-based, and technology-assisted interventions in addressing the growing burden of NCDs in Indonesian communities.

Keywords: Non-Communicable Diseases, Cardiovascular Disease, Diabetes Mellitus, Health Education, Community Service

INTRODUCTION

Global and National Burden of Non-Communicable Diseases

Non-communicable diseases (NCDs) represent the leading cause of global mortality, accounting for nearly 36 million of 57 million deaths worldwide in 2019 [1]. Cardiovascular diseases contribute the largest proportion (39%), followed by cancers (27%), chronic respiratory diseases, and diabetes (4%). The burden is disproportionately higher in low- and middle-income countries, where premature mortality from NCDs (<60 years) reaches 29%, compared to only 13% in high-income countries [1].

Effective prevention of cardiovascular diseases requires **multifactorial interventions** that simultaneously address behavioral, metabolic, and environmental risk factors, rather than focusing on single isolated risks [2]. This approach aligns with evidence that combined strategies yield greater and more sustainable reductions in disease incidence compared to single-component programs. According to the *International Diabetes Federation (IDF) 2025 Global Diabetes Atlas*, approximately 537 million adults aged 20–79 years are living with diabetes globally, with projections rising to 783 million by 2045; nearly 80% of people with diabetes reside in low- and middle-income countries, including Indonesia [3].

Indonesia is undergoing a rapid epidemiological transition, with lifestyle changes and urbanization contributing to an increase in degenerative diseases. The 2018 Basic Health Research (Riskesdas) reported that 21.8% of Indonesians were obese, 2% had diabetes, and 3.8 per thousands of those over 15 years had chronic kidney disease [4]. These alarming figures indicate the urgent need for preventive strategies.

Local Context in Parepare City, South Sulawesi

Local reports highlight that Parepare City faces a high prevalence of NCDs. In 2024, 381 residents were registered with diabetes mellitus, while 562 were diagnosed with coronary heart disease [5]. At the Lompoe Health Center, 25 patients were regularly treated for DM and 21 for heart-related illnesses [6]. Given that Galung Maloang Village has a relatively small population, the number of cases indicates a severe public health challenge.

Rationale for Community Engagement

Health promotion and early detection are essential to reducing the burden of NCDs. However, limited community awareness, low screening coverage, and lack of coordination between families and health services hinder effective prevention. Therefore, a collaborative approach through a Community Partnership Program (Program Kemitraan Wilayah, PKW) was initiated. The program aimed to address knowledge gaps, improve health-seeking behavior, and strengthen the link between community members and primary healthcare providers.

Objective: This manuscript aims to describe the design, implementation, and outcomes of a community-based partnership program for preventing CVD and DM in Galung Maloang Village.

METHODS

Study Design and Setting

This was a descriptive community service intervention using a participatory action approach. The program was conducted between March and June 2025 in Galung Maloang Village, Bacukiki District, Parepare City, South Sulawesi Province, Indonesia. The area was selected due to its high burden of NCDs and existing collaboration with the School of Nursing, Poltekkes Kemenkes Makassar.

Participants and Stakeholders

Inclusion criteria: Residents aged 18–65 years who were permanent residents of Galung Maloang Village, willing to participate voluntarily, and able to communicate verbally or in writing.

Exclusion criteria: Residents with severe acute illness, cognitive impairment preventing informed consent, or those unable to attend at least one health education session without valid reason.

Participants included 215 residents meeting the above criteria, local health cadres, and representatives from the Lompoe Health Center. Key stakeholders were:

- **Academic partners:** Nursing faculty and students from Poltekkes Kemenkes Makassar
- **Community partners:** Village government, health cadres, and residents
- **Health partners:** Lompoe Health Center, Parepare City Health Office

Intervention Components

The intervention consisted of four major activities:

1. **Health Education Sessions:** Five interactive sessions on CVD and DM prevention covering risk factors, healthy diet, physical activity, stress management, and importance of routine checkups; delivered through lectures, discussions, and distribution of leaflets.
2. **Screening Activities:**
 - **Blood glucose:** Fasting blood glucose measured using the enzymatic glucose oxidase method with calibrated glucometers; pre-diabetes defined as fasting glucose 100–125 mg/dL per WHO standards [7].
 - **Blood pressure:** Measured twice on the right arm using a validated digital sphygmomanometer after 5 minutes of rest; early hypertension defined as systolic 130–139 mmHg or diastolic 80–89 mmHg per 2021 WHO guidelines [8].
 - **Body mass index (BMI):** Calculated as weight (kg) divided by height squared (m^2); obesity defined as BMI ≥ 25.0 kg/ m^2 for adults in Southeast Asia [9].
 - Residents with abnormal results were referred to the health center.
3. **Community Networking:** Establishment of a WhatsApp group with 180 members (residents, cadres, health workers) for follow-up, reminders, and educational messages.

4. Educational Materials: Development of a pocketbook titled *“Prevention of Cardiovascular Disease and Diabetes Mellitus in the Community”*, plus banners and local media coverage.

Data Collection and Analysis

Knowledge improvement was measured using pre- and post-test questionnaires with 20 items covering risk factors, signs and symptoms, and prevention practices of CVD and DM. Screening data were recorded and summarized. All results were analyzed descriptively and presented as frequencies, percentages, and means where applicable.

Ethical Considerations

This community service project received ethical approval from the School of Nursing, PoltekkesKemenkes Makassar on **12 February 2025**, with approval number **KEP/012/VI/2025**. All activities were conducted in collaboration with the local government. Informed consent was obtained from all participants before data collection; confidentiality of personal information was strictly maintained.

RESULTS

Participant Characteristics

A total of 215 residents participated in the program, with a **mean age of 42.7 ± 11.3 years** (range 18–65 years). Of these, 124 (57.7%) were female and 91 (42.3%) were male; 62.3% had completed primary or secondary education, and 37.7% had higher education or no formal schooling.

Health Education Outcomes

Five structured health education sessions were implemented, with active participation from all attendees. Knowledge levels improved substantially: adequate understanding of CVD and DM prevention rose from 53% (pre-test) to 87% (post-test). The largest improvements were observed in knowledge of reducing salt, sugar, and fat intake, and the importance of regular health checkups.

Screening Outcomes

Screening results are presented in Table 1 below.

Tabel. Screening results

Condition	Number of Participants	Percentage (%)
Pre-diabetes	32	14.9
Early-stage hypertension	18	8.4
Obesity	7	3.2
No detected abnormalities	158	73.5
Total	215	100

All individuals with abnormal findings were referred to the Lompoe Health Center for follow-up care. The detection of pre-diabetes and early hypertension confirms that many at-risk individuals would have remained undiagnosed without community-based screening.

Community Networking Outcomes

The WhatsApp group with 180 active members functioned as a platform for weekly health updates, reminders, and two-way communication. Health cadres responded to questions promptly, and the group facilitated seamless referral coordination between residents and health services.

Educational Material Outcomes

The pocketbook was distributed to 45 households, village officials, and health workers; leaflets were delivered to 300 households, and banners placed at key community points to reinforce preventive messages.

DISCUSSION

Effectiveness of Community Partnership

The 34% increase in knowledge scores aligns with findings from similar programs: a study in West Java reported a 28% improvement in diabetes-related knowledge after community-based education [10], while research in rural Sulawesi found that cadre-led interventions increased awareness of CVD risk factors by 31% [11]. This confirms that collaborative models involving academic institutions, health facilities, and community leaders are effective in improving health literacy, especially in underserved areas.

Importance of Early Detection

The 14.9% prevalence of pre-diabetes and 8.4% early hypertension is consistent with Riskesdas 2018 estimates for rural Indonesian populations [4]. A comparable program in Central Java detected 13.7% pre-diabetes and 9.1% early hypertension, reinforcing that community screening

identifies asymptomatic cases that would otherwise progress to chronic disease [12]. Early detection allows timely lifestyle modification and clinical management, reducing long-term complications and healthcare costs.

Role of Digital Platforms

The use of WhatsApp mirrors findings from other low-resource settings: a 2024 review showed that mobile-based communication improved follow-up adherence and knowledge retention by 22–25% in NCD prevention programs [13]. Familiarity and low cost make this tool suitable for Indonesian communities, though digital literacy remains a barrier for older adults.

Constraints and Limitations

Beyond previously noted challenges, additional constraints included:

- **System-level:** Limited funding for sustained screening supplies and lack of integrated NCD registers at the village level.
- **Community-level:** Cultural beliefs that prioritize traditional healing over early medical consultation, and competing livelihood demands reducing attendance at follow-up sessions.
- **Individual-level:** Low health literacy among older residents and limited confidence in adopting new dietary habits.

These findings highlight that while interventions are effective, long-term success requires addressing systemic, cultural, and individual barriers through multi-sector collaboration.

CONCLUSION

The Community Partnership Program in GalungMaloang Village effectively improved knowledge, detected early disease risks, and strengthened health networks for CVD

and DM prevention. The results confirm that multifactorial, community-centered interventions combining education, screening, and digital support are feasible and impactful. Sustained outcomes require institutional support, regular resource allocation, and efforts to address systemic and cultural barriers identified in this study. The model can be adapted for broader implementation across similar communities in Indonesia.

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