

COMMUNITY SERVICE ARTICLE

OPEN ACCESS

Manuscript received January 06, 2026; revised January 23, 2026; accepted June 02, 2026; date of publication June 30, 2026.

Digital Object Identifier (DOI): <https://doi.org/10.35882/ficse.v5i2.130>

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How to cite: Anik Handayati, Suhariyadi, Pestariati, "Mentoring and Improving Knowledge on the Benefits of Garlic in Reducing Blood Cholesterol Levels among Hypertensive Prolanis Members.", Frontiers in Community Service and Empowerment, vol. 5, no. 2, pp.xx-xx June 2026

Mentoring and Improving Knowledge on the Benefits of Garlic in Reducing Blood Cholesterol Levels among Hypertensive Prolanis Members

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ABSTRACT Hypertension is a non-communicable disease that is a major cause of stroke and coronary heart disease. It is commonly found in the community and is a significant contributor to mortality and disability worldwide. A preliminary study showed that more than 50% of Prolanis members in Bangsah Village, Sreseh Subdistrict, Sampang Regency had high cholesterol levels; therefore, alternative supplements are needed to reduce blood cholesterol levels. Garlic is a food ingredient that is widely available in the community but has not been widely utilized as a cholesterol-lowering supplement. Garlic contains allicin, which has strong antimicrobial, anti-inflammatory, and antioxidant properties. It also contains ajoene, saponins, flavonoids, and various sulfur compounds that contribute to its health benefits. Studies have shown that garlic consumption can help reduce total cholesterol and LDL levels. Therefore, education on processing garlic into black garlic is highly needed to reduce cholesterol levels among hypertensive Prolanis members. The results of the community service activity showed that the program was implemented smoothly and successfully, starting from the survey and coordination stage, the initial assessment, program implementation, and evaluation. The success of this PKM activity is expected to be beneficial for the wider community, especially regarding the use of garlic to reduce cholesterol levels. The evaluation results showed a 17% reduction in the number of hypertensive Prolanis members with high cholesterol levels.

INDEX TERMS hypertensive Prolanis participants, cholesterol, garlic

I. INTRODUCTION

Hypertension is one of the major non-communicable diseases and the leading risk factor for cardiovascular diseases, contributing significantly to global mortality and disability (1). Hypertension is often associated with dyslipidemia, a condition characterized by abnormal lipid profiles, including elevated total cholesterol, LDL, and triglycerides, and reduced HDL, which significantly increase the risk of stroke and coronary heart disease. Risk factors for hypertension and dyslipidemia include age, sex, unhealthy lifestyle, physical inactivity, obesity, smoking habits, and diabetes mellitus (2).

The government, through BPJS Kesehatan, has developed the Chronic Disease Management Program (Prolanis) as a promotive, preventive, curative, and rehabilitative effort for patients with hypertension and diabetes mellitus to achieve optimal quality of life. This program includes routine health check-ups, health education, group physical activities, and laboratory monitoring. However, its implementation still faces several challenges, such as low participant attendance, limited health personnel to provide counseling, and moderate to low

participant adherence, resulting in suboptimal program outcomes in many regions (3).

In Bangsah Village, Sreseh Subdistrict, Sampang Regency, the number of hypertensive Prolanis participants is relatively high, and most still exhibit abnormal lipid profiles. Low adherence to medication, limited awareness of healthy lifestyle practices, and insufficient health education have resulted in more than 40% of participants having uncontrolled hyperlipidemia, thereby increasing the risk of cardiovascular complications and reducing quality of life (4).

Garlic (*Allium sativum*) has long been recognized for its health benefits, particularly in lowering blood cholesterol levels. Its bioactive compounds, such as allicin, ajoene, flavonoids, and other sulfur-containing compounds, contribute to reducing total cholesterol, LDL, and triglycerides, and increasing HDL through mechanisms involving inhibition of cholesterol synthesis as well as antioxidant and anti-inflammatory effects (5),(6). Therefore, garlic has strong potential as a natural supplement to support

dyslipidemia management and cardiovascular disease prevention (7)(8).

Based on the high prevalence of hypertension accompanied by dyslipidemia and the poor control of lipid profiles among Prolanis participants in Bangsah Village, the provision of garlic as a complementary supplement, combined with healthy lifestyle education and routine lipid profile monitoring, is a relevant strategy within community service activities. This intervention is expected to help improve lipid profiles, reduce the risk of cardiovascular complications, and sustainably enhance the quality of life of Prolanis participants.

II. METHOD

The problem-solving approach to reducing lipid profiles among hypertensive Prolanis participants (Prolanis HT) was implemented through collaboration with partners, namely the Head of Bangsah Village, the Head of the Bangsah Village Health Post (Poskesdes), and the Sresseh Health Center. The partners played roles in providing the activity venue, supporting program implementation, and facilitating assistance by health personnel. The initial stage of the program included technical coordination, activity scheduling, determination of persons in charge, and the implementation of a group-based initial assessment to identify participants' level of understanding regarding lipid profile control through healthy lifestyle practices and garlic consumption, as well as awareness of complication risks such as stroke and coronary heart disease. The assessment results were used as the basis for developing educational modules and planning subsequent interventions.

The implementation stage consisted of regular counseling and consultation sessions on lipid profiles, cholesterol control, the importance of adherence to routine health examinations, and education on the benefits of garlic as a natural cholesterol-lowering supplement. Participants were provided with garlic capsules for three months as a stimulus for behavioral change. Evaluation was conducted through lipid profile examinations at the end of the program to determine the percentage of participants who achieved normal cholesterol levels. The program concluded with the preparation of a report and a seminar on the results of the community service activities, as well as recommendations for the continued consumption of garlic and the adoption of a healthy lifestyle to maintain controlled lipid profiles.

III. IMPLEMENTATION

The implementation of the community service program (PKM) was divided into four stages, namely survey and coordination, initial assessment, core activities, and evaluation.

1. Survey and Coordination with Partner Health Center

In this stage, the Poltekkes community service team collaborated with the partner institution, Sresseh Health Center in Sampang Regency, Madura, to discuss the planned activities so that they were aligned with the health center's work program, including technical implementation, scheduling, and location. Coordination was also conducted

with the Head of Bangsah Village as the location of the community service activities.



FIGURE 1. Coordination with partner institutions

FIGURE 1. Based on the results of the survey and coordination with the Health Center and the Head of Bangsah Village, it was agreed that the PKM activities would be conducted in Bangsah Village on May 14, 2025. On that date, a socialization session would be held for members of the Hypertension Prolanis in Bangsah Village, Sresseh Subdistrict, Sampang Regency, Madura.

2. Initial Assessment Activity (May 7, 2025)

The initial assessment aimed to obtain more in-depth information regarding the knowledge, attitudes, and behaviors of Hypertension Prolanis members toward cholesterol control. The assessment was conducted through interviews with the participants. The results showed that most Hypertension Prolanis members did not yet understand cholesterol and its impact on health. The use of garlic to reduce cholesterol levels had not become a daily habit. The level of adherence to routine lipid profile examinations was still low, as most participants only underwent testing when experiencing health complaints. During this activity, participants were informed about the upcoming community service program and were asked for their willingness to attend and participate.

3. Core Activities (May 14, 2025)

The core activities were attended by 59 Hypertension Prolanis members and were also attended by representatives from Sresseh Health Center and the Head of Bangsah Village. The activities were conducted in several sessions:

A. OPENING SESSION

The program was officially opened with remarks from a representative of Sresseh Health Center (the village midwife)



FIGURE 2 Opening of the PKM activity by the village midwife

and the head of the PKM team. The purpose of this session was to convey the objectives of the program.

Result: The PKM participants were very enthusiastic and eager to take part in the series of PKM activities.

B. CHOLESTEROL LEVEL EXAMINATION

Cholesterol measurement was the opening health service activity. High participant enthusiasm indicated early success in improving access to health services among Prolanis members.



FIGURE 3. Cholesterol level examination before the PKM education activity

Results : showed that out of 59 participants, 37 people (63%) had high cholesterol levels, while 22 people (37%) had normal cholesterol levels.

C. PROLANIS EXERCISE SESSION

This activity consisted of guided physical exercise led by a health instructor with simple movements that were easy for all participants to follow.



FIGURE 4. Prolanis Exercise Activity.

Result: Participants showed high enthusiasm during the session.

D. EDUCATION ON LIPID PROFILE EXAMINATION

Educational sessions were delivered by the PKM team, covering the importance and function of lipid profile examinations.



FIGURE 5. Counseling/Education Activity Conducted by the Community Service Team.

Result : Participants showed improved understanding of the importance of lipid profile monitoring.

E. EDUCATION ON THE BENEFITS OF GARLIC FOR PREVENTING STROKE AND CORONARY HEART DISEASE

This session explained the cardiovascular benefits of garlic and appropriate consumption methods.



FIGURE 5. Counseling/Education Activity Conducted by the Community Service Team.

Result : Participants were highly engaged and attentive.

F. EDUCATION ON PROCESSING GARLIC INTO BLACK GARLIC

Participants were educated on processing garlic into black garlic to increase its nutritional and economic value. Leaflets and sample products were distributed.

Result :

The activity ran smoothly and participants were enthusiastic



FIGURE 6. Introducing Black Garlic

G. EVALUATION ACTIVITY (JUNE 14, 2025)

Evaluation was conducted by measuring cholesterol levels after participants followed the program and consumed black garlic regularly.



FIGURE 7. Cholesterol level measurement of participants after the community service program

IV. RESULT

The results of the community service activities are presented as follows:

TABLE 1.

Cholesterol Levels Before and After the PKM Program

Cholesterol Level	Before (F)	Before (%)	After (F)	After (%)
High	37	62.7	27	45.8
Normal	22	37.3	32	54.2
Total	59	100	59	100

In **TABLE 1** Based on the results, before the PKM program 37 participants (63%) had high cholesterol levels and 22 participants (37%) had normal levels. After the program and regular consumption of black garlic, the number of participants with high cholesterol decreased to 27 people (46%), while those with normal cholesterol increased to 32 people (54%).

TABLE 2.

Reduction in High Cholesterol Levels

Condition	Frequency	Percentage
Before	37	63%
After	27	46%
Difference	10	17%

In **TABLE 2** These results indicate that the number of participants with high cholesterol decreased by 10 people (17%) after participating in the program and consuming black garlic regularly. This suggests that the PKM program was effective in reducing cholesterol levels among Hypertension Prolanis members in Bangsah Village, Sreseh Subdistrict, Sampang Regency, Madura.

V. CONCLUSION

1. The community service program (PKM) was implemented successfully and smoothly, starting from the survey and coordination stage, the initial assessment, the implementation of the PKM activities, and the evaluation of the results obtained.

2. The utilization of garlic in the form of black garlic is expected to reduce cholesterol levels among hypertensive Prolanis members, thereby decreasing the risk of stroke and coronary heart disease.
3. The evaluation results showed that there was a 17% reduction in the number of hypertensive Prolanis members with high cholesterol levels after regularly consuming black garlic.

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