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Education and training on the use of herbal medicines as complementary therapies for hypertension and diabetes

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ABSTRACT
Hypertension and diabetes mellitus are two non-communicable diseases with increasing prevalence in Indonesia, including in rural areas such as Kamulyan Village, Bantarsari Subdistrict, Cilacap Regency. Both conditions require long-term management using a holistic approach, including integrating complementary therapies based on medicinal plants. Unfortunately, community understanding of herbal medicine's proper and safe use remains limited. This community service program aims to improve the knowledge and skills of residents in Kamulyan Village in utilising herbal remedies as complementary therapy for hypertension and diabetes mellitus. The implementation methods included health education sessions on the introduction of hypertension and diabetes, as well as education on various types of local medicinal plants that are empirically proven to help control blood pressure and blood glucose levels, such as bay leaves (Syzygium polyanthum), bitter leaf (Andrographis paniculata), Phyllanthus niruri, cat's whiskers (Orthosiphon aristatus), and Tinospora crispa.
In addition, practical training was conducted on preparing and processing these herbs into simple formulations that can be used independently at home, such as herbal teas, decoctions, and dried capsules. The activity was attended by 50 participants: health cadres, elderly residents, and patients with hypertension and diabetes. Through pre-test and post-test assessments, participants' knowledge and skills related to herbal medicine usage were significantly increased. Participants also demonstrated high enthusiasm for cultivating and utilizing family medicinal plants (TOGA) around their homes. This initiative is expected to be the first step toward community self-reliance in maintaining health naturally and sustainably. In the future, further assistance and cross-sector collaboration are needed to develop the scientific, safe, and effective use of herbal medicine at the community level.

Keywords: Complementary therapy; Diabetes mellitus; Health education; Herbal medicine; Hypertension.

INTRODUCTION

Non-communicable diseases (NCDs) such as hypertension and diabetes mellitus have become major global public health challenges due to their high prevalence, chronic nature, and substantial impact on morbidity and mortality [1]. According to the World Health Organization [2], more than 1.28 billion adults worldwide are living with hypertension, while approximately 422 million people suffer from diabetes mellitus. Together, these two conditions account for over 12 million deaths annually, underscoring their significance as leading causes of premature mortality. In Indonesia, the 2018 Basic Health Research (Riskesdas) report revealed that the prevalence of hypertension reached 34.1%, while diabetes mellitus was reported at 10.9% [3]. The increasing burden of these diseases is closely associated with sedentary lifestyles, excessive sugar and salt intake, and insufficient physical activity [4].

Effective management of hypertension and diabetes mellitus requires not only pharmacological treatment but also holistic, sustainable approaches that address lifestyle modifications and preventive strategies [5]. One approach that has gained attention is the integration of complementary therapies, particularly herbal medicines, into routine disease management. With its rich biodiversity and deep-rooted tradition of herbal medicine, Indonesia offers numerous medicinal plants with empirically proven benefits in controlling blood pressure and blood glucose levels [6]. Plants such as Syzygium polyanthum (bay leaves), Andrographis paniculata (bitter leaf), Phyllanthus niruri (meniran), Orthosiphon aristatus (cat's whiskers), and Tinospora crispa (brotowali) have been investigated for their pharmacological properties, including anti-inflammatory, antioxidant, and insulin-sensitizing effects [7].

Despite their potential, the use of herbal medicines as complementary therapy remains limited, especially in rural communities where access to scientific information and healthcare services may be constrained. Misconceptions, lack of standardized preparation methods, and unawareness of potential side effects or drug–herb interactions contribute to suboptimal and sometimes unsafe use of herbal remedies [8]. Therefore, empowering communities with accurate knowledge and practical skills in identifying, cultivating, processing, and safely using medicinal plants is crucial for optimizing the role of herbal medicine in chronic disease management [9].

Community-based health education and skill-building programs effectively improve health literacy and promote self-care behaviors in rural populations [10]. Training sessions that combine theoretical knowledge with hands-on practice enable participants to confidently apply what they learn daily, fostering greater self-reliance in managing chronic diseases. Moreover, such initiatives help preserve local wisdom and biodiversity by promoting Tanaman Obat Keluarga (TOGA), or family medicinal plants, which can be cultivated at home as a readily available and low-cost resource. Kamulyan Village, located in Bantarsari Subdistrict, Cilacap Regency, is a rural area where hypertension and diabetes mellitus are prevalent, and where herbal medicine traditions still play a role in community health practices. However, many residents lack structured guidance on the appropriate and safe use of herbal remedies. In response to this need, a community service program was designed to provide education and practical training on using herbal medicines as complementary therapy for hypertension and diabetes. The program sought to increase participants' knowledge of relevant medicinal plants, improve their skills in preparing herbal formulations such as teas, decoctions, and dried capsules, and encourage the cultivation of TOGA at the household level. By integrating evidence-

based herbal medicine education into community health activities, this initiative aimed to reduce the burden through a sustainable, culturally appropriate, and self-reliant approach. Furthermore, it aligns with WHO recommendations on integrating traditional and complementary medicine into primary healthcare, particularly in resource-limited settings.

METHOD

The following are the methods of implementing service activities

No.	Activity Stage	Activity Description	Method	Time of Implementation	Output
1	Preparation	Coordination with village officials, health cadres, and local health center (Puskesmas) - Initial survey and needs assessment - Preparation of training materials and modules - Recruitment of participants	Observation, interviews, literature review	Week 1	Participant list, training modules, and educational materials
2	Health Education	Counseling on hypertension and diabetes - Education on types of local medicinal plants and their benefits	Interactive lectures, discussions, Q&A	Week 2 (Day 1)	Increased participants' knowledge of herbal therapy
3	Practical Training	Identification and cultivation of family medicinal plants (TOGA) - Practice in making herbal tea, decoctions, and dried herbal capsules - Safe storage and usage methods	Demonstration, hands-on practice, group guidance	Week 2 (Day 2)	Participants can process and use medicinal plants independently
4	Evaluation	Pre-test and post-test on participants' knowledge - Participant satisfaction questionnaire	Written test, survey	Week 2 (Day 2 – final session)	Data on knowledge improvement and participant satisfaction
5	Follow-up	Distribution of TOGA seeds and guidebook - Coordination with health cadres for continued monitoring	Material distribution, cadre mentoring	Week 3–4	Participants begin planting TOGA at home; cadres conduct regular monitoring.

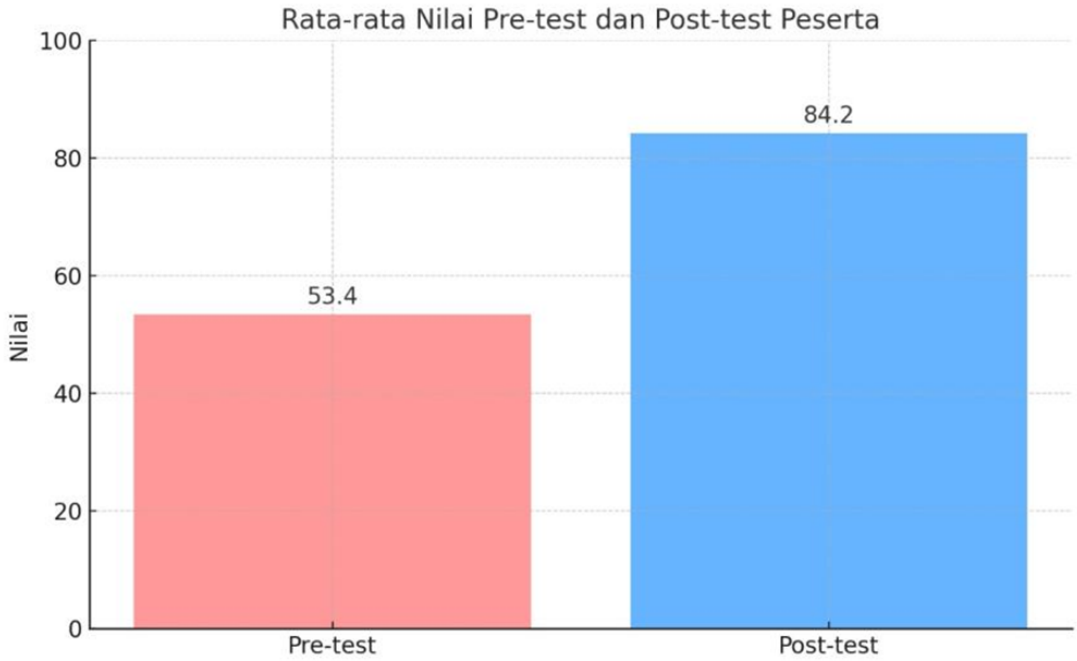
RESULT

The education and training activities in Kamulyan Village ran smoothly and were attended by 50 participants, including health cadres, the elderly, and residents suffering from hypertension and diabetes mellitus. The evaluation results showed a significant increase in participants' knowledge before and after the training. This can be seen from the average pre-test score of 53.4, which increased to 84.2 in the post-test. This increase reflects the effectiveness of counseling and training in increasing public understanding of using herbal medicines as complementary therapy. In addition to increasing knowledge, the participants' enthusiasm was also high during the practical training sessions. Participants actively participated in demonstrations and hands-on practice, concocting simple herbal remedies such as bay leaf tea and sambiloto stew. Some participants even brought medicinal plants from their homes to be recognized together, and their benefits and how to use them were discussed. Most participants said this activity was useful and applicable to daily life, especially for people with chronic diseases such as hypertension and diabetes.

As part of the program's sustainability support, the community service team distributed medicinal plant seeds such as cat whiskers, meniran, and brotowali to participants. Participants also received a guide booklet containing information on the benefits, cultivation methods, and processing of medicinal plants that can be done independently at home. In addition, village health cadres actively participated in this activity. They expressed their willingness to provide further assistance for residents who want to use medicinal plants to manage non-communicable diseases naturally and sustainably.

Figure 1. Service Activities: Filling out the pre- and post-surveys, as well as Socialization and Education of the Taklim Council

The average pre-test and post-test scores are shown in Figure 2



The evaluation of participants' knowledge before and after the educational and training sessions was conducted using a pre-test and post-test assessment. The average pre-test score was 53.4, indicating that the participants initially had a limited understanding of herbal medicine as a complementary therapy for hypertension and diabetes mellitus. This baseline score reflects the community's lack of structured and evidence-based information on medicinal plants, their preparation, and safe usage. Following the intervention, the post-test results showed a substantial increase in the average score to 84.2, representing an improvement of 30.8 points. This significant rise demonstrates the effectiveness of the program's combination of interactive health education and hands-on practical training in enhancing participants' comprehension and skills. The marked improvement suggests that the participants absorbed theoretical knowledge and gained the confidence and capability to apply it in real-life settings, such as identifying local medicinal plants, preparing herbal remedies, and understanding appropriate dosage and storage methods.

Furthermore, the increase in scores across nearly all participants indicates that the training methods were inclusive and adaptable to different educational backgrounds, particularly in rural communities. This outcome aligns with previous studies highlighting that participatory and context-based learning approaches improve health literacy in resource-limited areas. Pre-test and post-test results confirm that the community-based education and training program had a positive and measurable impact on participants' knowledge and practical skills regarding the safe and effective use of herbal medicine as a complementary therapy for chronic diseases.

DISCUSSION

The education and training activities significantly increased participants' knowledge and understanding of herbal medicines as complementary therapies for hypertension and diabetes mellitus. This is demonstrated by the rise in the average score from the pre-test of 53.4 to 84.2 in the post-test. Community-based educational approaches effectively increase public knowledge of traditional medicine [11]. The

education provided includes the identification of local medicinal plants such as Andrographis paniculata (sambiloto), Syzygium polyanthum (bay leaf), and Moringa oleifera (moringa leaf), which have scientific evidence supporting antihypertensive and antidiabetic benefits [12] [13].

People in rural areas such as Kamulyan Village tend to have limited access to modern health services, so using local medicinal plants as complementary therapies is an affordable and sustainable solution [14]. Emphasizes integrating traditional medicine into the primary health care system, especially in resource-constrained regions [15]. The use of herbal medicines accompanied by education about dosage, how to be presented, contraindications, and potential drug interactions is important to prevent side effects or irrational use [15] [16].

Training conducted using a participatory method has increased participants' confidence in mixing and using medicinal plants independently [17]. In addition, there is an increase in awareness of the importance of lifestyle changes and non-pharmacological treatment to support preventive efforts in controlling chronic diseases [18]. The combination of promotive and preventive approaches through medicinal plant education positively impacts the quality of life of people with non-communicable diseases [19]. This showed that hypertension patients who received herbal training experienced improved blood pressure in the medium term [20] [21].

The use of herbal medicine as complementary therapy is not a substitute for medical treatment, but a complement that supports the effectiveness of the primary treatment [22]. Every educational session needs to emphasize this to avoid societal misperceptions [23] [24]. Interventions like this are important in shaping the community's collective awareness of the importance of holistic disease management, while still paying attention to safety, efficacy, and appropriate use standards [25]. Overall, the results of this activity show that community-based education and training play an important role in empowering people to independently manage health, especially in controlling hypertension and diabetes through medicinal plants. In the future, it is necessary to strengthen collaboration between educational institutions, health workers, and village governments in continuous assistance to maintain the sustainability of safe and rational herbal practices.

CONCLUSIONS

Educational and training activities on using herbal medicines as complementary therapy for patients with hypertension and diabetes in Kamulyan Village showed positive results, marked by an increase in the knowledge and skills of participants in recognizing, concocting, and utilizing local medicinal plants independently. The community's enthusiasm is also high, especially in planting and developing Family Medicinal Plants (TOGA). Therefore, follow-up is needed in the form of continuous mentoring, advanced training for health cadres, and collaboration between village governments, health workers, and educational institutions so that the use of herbal medicines can continue to develop scientifically, safely, and integrally in efforts to control non-communicable diseases at the community level.

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