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# Optimizing the Role of Health Volunteers in Early Detection of Non-Communicable Diseases Through Community Nursing Education

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**ABSTRACT** The rising prevalence of non-communicable diseases (NCDs) such as hypertension, diabetes mellitus, and cardiovascular conditions poses a significant public health challenge, particularly among the productive age population. Early detection is essential to prevent complications and reduce the disease burden. However, limited human resources in primary healthcare often hinder optimal screening efforts. This community service initiative aimed to optimize the role of health volunteers in the early detection of NCDs through community nursing education. The program included participatory training sessions covering educational modules, practical simulations of blood pressure and glucose monitoring, and the development of effective health communication skills. Post-training evaluations significantly improved the volunteers' knowledge and competencies in conducting independent NCD screenings. The outcomes suggest that community-based educational interventions can empower health volunteers as frontline agents in promotive and preventive healthcare. This model holds promise for sustainable community engagement in NCD control strategies.

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## 1. INTRODUCTION

Non-communicable diseases (NCDs) such as hypertension, diabetes mellitus, and cardiovascular diseases have become the leading causes of morbidity and mortality globally, particularly in low- and middle-income countries. These diseases, often linked to lifestyle factors, develop slowly and persist over time, requiring long-term management and care. In Indonesia, the burden of NCDs continues to rise, posing significant challenges to the healthcare system and affecting individuals' productivity and quality of life (Suranta Ginting et al., 2024). Non-communicable diseases (NCDs), including hypertension, diabetes mellitus, cardiovascular disease, and cancer, have become leading causes of morbidity and mortality globally.

According to the World Health Organization (WHO), NCDs are responsible for over 70% of deaths worldwide, with a significant portion occurring in low- and middle-income countries (Putri et al., 2024). In Indonesia, the prevalence of NCDs continues to rise, placing a substantial burden on the healthcare system and reducing the quality of life among the productive-age population. Non-communicable diseases such as diabetes, cancer, and heart disease are global health challenges that require a holistic approach to their prevention and management. Promotive and preventive education has been recognized as an effective strategy for increasing public health awareness and reducing the incidence of non-communicable diseases.

Early detection is a critical strategy in addressing the growing prevalence of NCDs. Screening and monitoring can help identify at-risk individuals and prevent complications through timely intervention (Hijrah et al., 2025). However, implementing early detection programs at the community level is often constrained by the limited availability of healthcare professionals and resources in primary care settings. Health volunteers play a pivotal role in bridging this gap. As trusted community members, they are well-positioned to support health promotion and disease prevention activities. Despite their strategic potential, many health volunteers lack the training and confidence to effectively carry out early detection tasks. Early detection and preventive measures are essential to reduce the impact of NCDs (Suprapto et al., 2025). However, limitations in healthcare infrastructure, especially in rural and underserved areas, pose challenges in implementing routine screenings and health promotion programs. One strategic solution is to empower community-based resources, particularly health volunteers, who serve as a bridge between healthcare providers and the community (Bongga Linggi et al., 2024).

Community nursing education offers an opportunity to enhance the capacity of health volunteers through structured, participatory training that integrates theoretical knowledge with practical skills (Lacey et al., 2024). By equipping volunteers with competencies in screening procedures, health communication, and basic data collection, they can contribute more meaningfully to preventing and controlling NCDs at the grassroots level. Health volunteers are vital in promoting health behaviors, disseminating health information, and facilitating early detection activities at the grassroots level (Vinay & Biller-Andorno, 2023). Nevertheless, many lack adequate training and confidence to carry out these responsibilities effectively, especially concerning NCDs. Community nursing education offers a solution by equipping health volunteers with the knowledge, skills, and motivation to perform early detection and health promotion activities in their communities. Older adults' knowledge and attitudes toward using services are important in determining their level of participation in the program (Piel et al., 2023). This community service initiative aimed to optimize the role of health volunteers in the early detection of non-communicable diseases through a targeted community nursing education program. The intervention was designed to improve their knowledge, skills, and confidence,

strengthening the broader primary healthcare system through community empowerment.

## 2. METHOD

This community service program employed a participatory approach through community nursing education to strengthen health volunteers' role in detecting non-communicable diseases (NCDs) early. The program was conducted over four weeks in a selected community health center area with a high prevalence of NCDs.

*Participants*

The participants were 25 active health volunteers selected by the local health center based on their engagement and availability. All participants had essential experience in community health activities but had not received formal NCD screening training.

*Intervention Design*

The intervention included the following components: Educational Sessions. Interactive lectures and discussions were held on the basic concepts of NCDs, risk factors, signs and symptoms, and the importance of early detection. These sessions also covered the role of health volunteers in promoting healthy lifestyles and conducting basic screenings. Skill-Based Training. Practical workshops were conducted to train participants in measuring blood pressure using digital sphygmomanometers, checking blood glucose levels using glucometers, and recording screening results accurately. Health Communication Training. Role-play and group activities were used to improve communication techniques, including educating community members about NCDs and encouraging participation in screening programs. Evaluation. A pre-and post-test was administered to assess knowledge gain, and practical assessments were used to evaluate competency in using screening tools. Participant feedback was also collected to measure satisfaction and perceived usefulness of the program.

*Data Analysis*

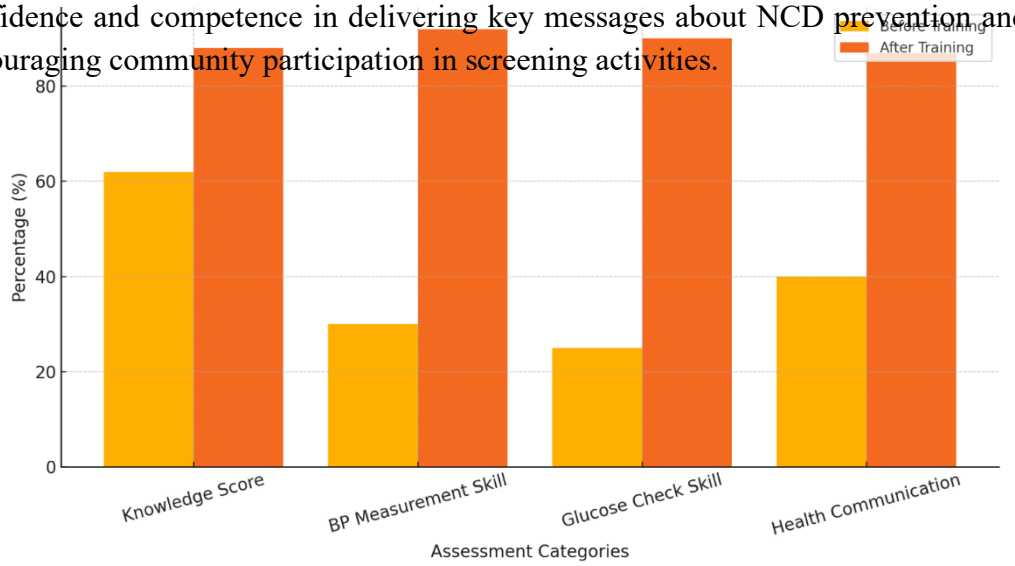
Descriptive statistics were used to compare pre-and post-intervention knowledge scores. Observational checklists were utilized to evaluate skill acquisition during practical sessions.

## 3. RESULT AND DISCUSSION

### RESULT

Implementing the community nursing education program significantly improved knowledge and practical skills among participating health volunteers. The pre-test and post-test scores indicated a notable increase in understanding of non-communicable diseases (NCDs), with average scores rising from 62% before the training to 88% after the intervention. This suggests that the educational sessions effectively enhanced participants' theoretical knowledge of NCD risk factors, symptoms, and the importance of early detection. In the practical assessments, over 90% of the volunteers could accurately measure blood pressure and blood glucose

levels using appropriate equipment, interpret the results correctly, and document their findings. The health communication role-play activities also showed improved confidence and competence in delivering key messages about NCD prevention and encouraging community participation in screening activities.




**Grafis 1. Health volunteers' performance before and after training**

After participating in community nursing education programs, the graph shows significant improvements in four key aspects of healthcare capabilities. Knowledge of Non-Communicable Diseases (NCDs). The knowledge score increased from 62% to 88% after training. This shows that the educational materials can increase cadres' understanding of the basic concepts of NCDs, risk factors, and the importance of early detection. Ability to measure blood pressure. Before the training, only 30% of cadres could take blood pressure measurements correctly. After training, this figure jumped to 92%. This shows that hands-on practice sessions are very effective in improving the technical skills of cadres. Ability to measure blood sugar. The skill of measuring blood sugar levels increased from 25% to 90%. Just like blood pressure measurement, practical training with relevant tools dramatically contributes to improving this ability. Health Communication Skills. Communication has also increased significantly, from 40% to 87%. This shows that simulation-based and role-play training has built cadres' confidence in conveying health messages to the public. These results confirm that the community nursing-based participatory education approach is very effective in increasing the capacity of health cadres. They are more prepared, knowledgeable, and confident in carrying out promotive and preventive actions in society.

## DISCUSSION

The results of this community service initiative demonstrate that targeted community nursing education significantly enhances health volunteers' capacity to detect non-communicable diseases (NCDs) early. The notable improvements in knowledge and practical skills reflect the effectiveness of participatory learning methods that blend theory, hands-on practice, and communication training. The increase in knowledge scores from 62% to 88% indicates that the educational content

was well-understood and relevant to the volunteers' roles. Understanding the basic concepts of NCDs is a critical foundation, as it empowers volunteers to recognize early warning signs and educate the public about risk factors and prevention strategies. The most striking improvements were in technical skills, particularly in measuring blood pressure and blood glucose levels. Before the training, most volunteers lacked confidence and had limited experience with these procedures. After the intervention, over 90% demonstrated competence in using digital tools for screening, interpreting results, and recording data accurately. This finding supports existing literature suggesting skill-based training is essential to empower non-professional health workers to perform basic health services. Moreover, the volunteers' enhanced ability to communicate health messages is equally significant. The increased confidence and effectiveness in delivering health education shows that communication training, including simulations and role-playing, is valuable in volunteer development (Coles et al., 2024). Effective communication is vital in behavior change and community participation, particularly when addressing chronic diseases requiring lifestyle adjustments (Nowrin et al., 2023).

Broader task-shifting strategies, such as those promoted by the World Health Organization, encourage the redeployment of healthcare professionals to trained lay health workers to improve access to services in low-resource settings (Prinja et al., 2024). When well trained, health volunteers become key players at the forefront of health promotion and disease prevention, helping reduce the burden on primary healthcare facilities. The importance of community-based interventions in improving community health. Health workers act as a bridge between the healthcare system and the community, especially in areas with a shortage of healthcare professionals (Schwalm et al., 2025). By equipping them with relevant skills, health workers can contribute significantly to promoting healthy lifestyles, identifying at-risk individuals, and referring them to formal health facilities. These positive outcomes require ongoing support, supervision, and regular retraining (Agyepong et al., 2023). Local healthcare facilities need to integrate health workers into broader community health strategies, recognizing them not as mere supporters but as important partners in disease promotion and prevention efforts (Ginsburg et al., 2023). The success of this program underscores the great potential of community nursing education in empowering health workers. When well-trained, they can play a significant role in the early detection and control of NCDs at the community level (Marijon et al., 2023).

Cadres gain a deeper understanding of NCDs, including risk factors, symptoms, and the importance of early detection. This basic knowledge is very important because it will affect the way cadres interact with the community and identify individuals who are at risk (Wang et al., 2024). A sharp increase in blood pressure and blood sugar measurement skills attests to the effectiveness of practice-based and simulation-based learning methods. Before the training, most participants were not used to using the tools or following the procedure. However, more than 90% could do it after the training session. This has a major impact, especially in areas with

limited access to routine screening services. The health communication aspect has also experienced a significant increase (Okuhara et al., 2025). Effective communication allows cadres not only to convey information but also to encourage healthy behavior changes in society. The rise in competence from 40% to 87% shows that role-play methods and interactive activities have succeeded in building the confidence and effectiveness of cadres in conveying health messages. The importance of community-based interventions in improving public health outcomes. Health cadres act as a bridge between the health service system and the community, especially in areas with a shortage of medical personnel (Dermody et al., 2024).

By providing relevant training, cadres can play an important role in promoting healthy behaviors, identifying at-risk individuals, and referring them to formal health facilities if needed. Maintaining the results achieved requires continuous support, supervision, and regular refresher training (Cini et al., 2023a). Local health centers must integrate health cadres into broader public health strategies, recognizing them as helpers and important disease promotion and prevention partners. The success of this program confirms the potential of community nursing education in empowering health cadres. With the right training, they can make a real contribution to the early detection of NCDs and help reduce the burden of disease at the community level. The success of this program suggests that continuous, structured training should be integrated into community health programs to ensure sustainability. Follow-up mentorship, refresher sessions, and collaboration with local health authorities are recommended to maintain and expand the impact of volunteer-led health initiatives.

## 4. CONCLUSION

This community nursing education program has effectively increased health cadres' capacity to detect non-communicable diseases (NCDs) early. Through a participatory and practical training approach, cadres experience a significant increase in knowledge, technical skills (blood pressure and blood sugar measurement), and health communication skills. Empowering health cadres through targeted education allows them to play an active role as agents of health promotion and prevention at the community level. This is especially important in areas with limited medical personnel, where cadres can spearhead early screening and public education efforts. Hopefully, this program can become a sustainable model adopted in other regions to support national strategies to control community-based NCDs. In the future, further training, regular supervision, and support from health service facilities are needed to ensure that the role of cadres can continue to run optimally and sustainably.

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## CONFLICT OF INTERESTS

All authors declare no conflict of interest in this community service program.

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