



Community-Based Training for Pesantren Cadres in Producing Celery Extract Drinks to Support Hypertension Prevention

Abraham Ahmad Ali Firdaus^{1*}, Paramita Sari¹, Mia Puspitasari¹, Ken Putri Raudhatul Jannah¹, Dewi Adila Sonia Zain¹, Alief Aditya Permana¹, Ghalief Fernanda Putra Fardian¹, Din Farhan Kamil¹, Mufidah Sheena²

Published online: 17 December 2025

ABSTRACT

Non-communicable diseases are the leading cause of death globally, with hypertension being one of the most prevalent conditions characterized by elevated blood pressure above normal limits. In Sampang Regency, Madura, more than 15,000 hypertension cases were reported in 2022, reflecting significant public health concern. Poor health literacy, high-salt and high-fat dietary habits, and lack of physical activity contribute to the growing incidence. This community service program was conducted at Darussalam Al-Faisholiyah Islamic Boarding School in Sampang, aiming to improve the capacity of pesantren cadres in hypertension prevention through training on producing herbal drinks made from celery extract as a complementary therapy. The program included educational sessions on hypertension, hands-on practice in herbal drink preparation, and pre-test and post-test evaluations. Fifteen pesantren cadres actively participated in the activity. The results showed an increase in participants' average knowledge scores from 7.4 to 8.4, indicating better understanding and practical skills. The program successfully enhanced health literacy, promoted healthy lifestyle awareness, and empowered the pesantren community to engage in preventive health practices. This initiative has the potential to be replicated in other pesantren to expand its preventive impact on hypertension, with continued mentoring and cadre monitoring recommended for sustainability.

Keywords: Blood Pressure Reduction; Community Empowerment; Herbal Supplement; Islamic Boarding School; Local Herbal Utilization; Public Health Education.

INTRODUCTION

Non-communicable diseases (NCDs) remain one of the leading public health challenges worldwide, with increasing prevalence and mortality rates each year. Among these diseases, hypertension is one of the most significant due to its long-term health consequences and contribution to cardiovascular morbidity and mortality. According to the World Health Organization (2023), hypertension affects more than 1.13 billion people globally and is projected to reach 1.5 billion by 2025. In Indonesia, the prevalence of hypertension among adults aged 30–79 years has reached approximately 36% (Riskesdas, 2023). This condition is further exacerbated by low public awareness regarding blood pressure monitoring and the adoption of healthy lifestyles, resulting in many cases being detected only after complications arise.

A similar situation is observed in Sampang Regency, Madura, where more than 15,000 hypertension cases were recorded in 2022, making it a significant public health issue in the region. The dominant risk factors include high salt and fat

¹ Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya

² Research and Community Service Unit (UPPM), Faculty of Medicine, Universitas Nahdlatul Ulama Surabaya

*) *corresponding author*

Abraham Ahmad Ali Firdaus
Email: abraham.ahmad@unusa.ac.id

consumption, lack of physical activity, smoking habits, and limited use of natural ingredients as complementary therapies.

Darussalam Al-Faisholiyah Islamic Boarding School, one of the largest *pesantren* in Sampang, plays an influential role as a center for Islamic education with a large number of students. Given its strategic position, the *pesantren* has the potential to become an agent of change in promoting healthy lifestyles among its community. However, limited health facilities, low health literacy, and the absence of dedicated health cadres focusing on hypertension prevention have hindered the implementation of effective promotive and preventive efforts.

Several studies have demonstrated that community empowerment through health cadre training is an effective strategy to improve knowledge, skills, and awareness in hypertension prevention. One applicable approach is the utilization of celery (*Apium graveolens*) as a complementary therapy. Celery contains apigenin, luteolin, potassium, and flavonoids, which possess natural diuretic properties and contribute to lowering blood pressure (Hedayati et al., 2019).

Based on this condition, a community service program entitled “Training for Pesantren Cadres in Producing Celery Extract Drinks as a Supplement for Hypertension Management” was implemented. This program aimed to enhance the capacity of *pesantren* cadres in hypertension prevention through education and practical training using local herbal ingredients. It is expected that these trained cadres can serve as agents of behavioral change, fostering healthier lifestyles within the *pesantren* community. Furthermore, this initiative is designed to serve as a sustainable model for pesantren-based community empowerment that can be replicated in other regions.

LITERATURE OR CONCEPTUAL REVIEW

Hypertension remains one of the most prevalent non-communicable diseases globally and is influenced by multiple risk factors including age, gender, family history, genetics, excessive salt intake, obesity, sedentary behavior, and smoking habits (Arlianti et al., 2019). These risk factors contribute to the rising incidence of hypertension in various regions, including rural areas where public health literacy and access to preventive care are limited. In Indonesia, such conditions are particularly concerning due to the growing prevalence of hypertension among adults and the lack of early detection programs.

Islamic boarding schools *pesantren*, as faith-based educational institutions, hold a strategic position in shaping the health behavior of both students and surrounding communities. Despite this potential, most pesantren still lack trained health cadres capable of addressing or preventing non-communicable diseases such as hypertension. Consequently, community-based interventions are essential to improve awareness, enhance practical health skills, and promote lifestyle modification within these institutions.

One promising local approach involves the use of celery *Apium graveolens* as a natural complementary therapy. Celery contains apigenin, flavonoids, vitamin C, apiin, calcium, and magnesium, which have been shown to prevent blood vessel constriction and reduce high blood pressure (Simamora et al., 2021). Utilizing celery extract in educational and practical training activities provides a culturally acceptable, low-cost, and sustainable solution for hypertension prevention in pesantren communities.

Darussalam Al-Faisholiyah Islamic Boarding School, located in Sampang Regency, represents a large pesantren with students from diverse socioeconomic backgrounds across Madura Island. The institution maintains an active organizational structure comprising teachers, caregivers, and student cadres who participate in various religious and social activities. However, the lack of structured health education programs presents both a challenge and an opportunity for community-based health empowerment. Therefore, introducing herbal-based health promotion within pesantren settings not only aligns with Islamic values of self-care and stewardship but also offers an effective grassroots model for hypertension prevention.

MATERIALS AND METHODS

The community service activity was carried out at Darussalam Al-Faisholiyah Islamic Boarding School, located in Sampang Regency, Madura, East Java, Indonesia. The program was implemented on May 14, 2025, as part of an empowerment initiative aimed at improving pesantren cadres capacity in preventing and managing hypertension through the utilization of local herbal ingredients. The participants consisted of 15 pesantren cadres selected based on recommendations from the pesantren leader and the management of the Islamic Boarding School Health Unit (*Unit Kesehatan Pesantren* or UKP). The selected cadres included senior students and teachers (*ustaz/ustazah*) who play strategic roles in disseminating health information and education among other students and the surrounding community.

The implementation procedure consisted of three main stages: preparation, implementation, and evaluation. The preparation stage included proposal drafting, funding submission, coordination with pesantren authorities, and field observation to determine the activity site. Educational media were developed during this phase, including PowerPoint slides, leaflets, educational videos, and evaluation instruments in the form of pre-test and post-test questionnaires.

During the implementation stage, participants received a health education session on hypertension, its risk factors, and preventive strategies through healthy lifestyle modification. This was followed by hands-on training on producing herbal supplement drinks from celery extract (*Apium graveolens*) as a complementary therapy to help lower blood pressure. Participants practiced the preparation process directly, guided by the facilitator team. The training also included an interactive discussion regarding the benefits of herbal plants and their practical applications in daily life.

The final stage involved program evaluation. Participants completed pre-test and post-test assessments to evaluate their improvement in knowledge and skills. The results demonstrated a notable increase in participants' understanding, with an average pre-test score of 7.4 and a post-test score of 8.4, indicating a 13.5% improvement. The main outcomes measured in this program were the enhancement of participants knowledge and practical skills in hypertension prevention and the utilization of celery extract as a natural herbal supplement.

RESULTS AND DISCUSSION

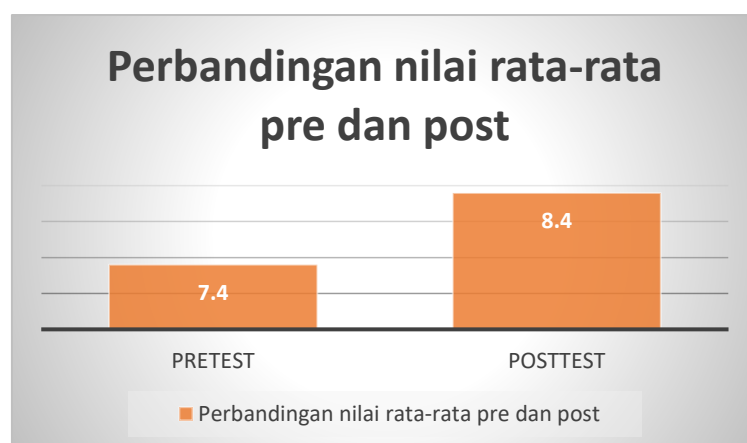


Figure 1. Comparison of Pre-Test and Post-Test Average Scores

The community service activity entitled *Training for Pesantren Cadres in Producing Celery Extract Drinks to Support Hypertension Prevention* was successfully conducted on May 14, 2025, at Darussalam Al-Faisholiyah Islamic Boarding School, Sampang, Madura. A total of 15 participants, consisting of senior students and pesantren health cadres, actively participated in the program. The activity began with a health education session focusing on the definition, risk factors, and prevention

strategies of hypertension, followed by a hands-on training session on the preparation of herbal supplement drinks from celery extract.

Participant knowledge was assessed through pre-test and post-test evaluations conducted before and after the training. The results revealed a notable improvement in participants' understanding of hypertension and the use of herbal ingredients. The average pre-test score was 7.4, which increased to 8.4 in the post-test, reflecting a 13.5% increase in knowledge. Among the 15 participants, 14 showed an improvement in their scores, while one participant experienced a minor decrease that was not statistically significant. These findings indicate that the material was well-understood and effectively delivered to the participants.

In addition to the quantitative assessment, qualitative feedback obtained through discussions and question-and-answer sessions demonstrated that participants were able to comprehend the health concepts and successfully reproduce the celery extract drink during the practice session. The participants also expressed enthusiasm in applying and sharing this knowledge within their pesantren community, suggesting the potential sustainability of this health education model.

DISCUSSION

The results of this community service program demonstrate that community-based education and training are effective in improving knowledge and practical skills among pesantren cadres in the prevention and management of hypertension. The observed increase in post-test scores indicates that the participatory learning method used in this program successfully facilitated the transfer of knowledge and skills. This finding aligns with previous research by Hedayati et al. (2019), which highlights that celery (*Apium graveolens*) contains flavonoids, apigenin, and luteolin with natural diuretic and vasodilatory properties that help reduce blood pressure. The practical component of this program, in which participants directly prepared celery extract drinks, enhanced experiential learning and strengthened the participants' confidence to apply herbal-based approaches in daily health practices.

The novelty of this program lies in the integration of local herbal utilization with pesantren-based community empowerment. Islamic boarding schools (*pesantren*) hold a strategic role in shaping attitudes and behaviors of students and the surrounding community, making them ideal platforms for health promotion. By combining religious values with scientific health education, this program fostered a holistic understanding of health as both a physical and spiritual responsibility. Trained cadres now serve as health ambassadors who can sustain the dissemination of hypertension prevention strategies within the pesantren environment.

Beyond individual knowledge improvement, this initiative has broader implications for community health development. It reinforces the concept of *community engagement*, which emphasizes active participation and shared responsibility between health educators and the community. Such participatory approaches have been shown to enhance program acceptance, promote behavioral change, and support long-term sustainability of health interventions. The involvement of pesantren cadres in this program has therefore laid the groundwork for establishing pesantren as centers of health empowerment based on local wisdom and self-reliance, particularly through the use of accessible herbal resources.

CONCLUSIONS

The community service program conducted at Darussalam Al-Faisholiyah Islamic Boarding School, Sampang, entitled "Training for Pesantren Cadres in Producing Celery Extract Drinks to Support Hypertension Prevention," was successfully implemented and generated a positive impact

on the partner institution. Through educational sessions and hands-on training, participants gained new knowledge about hypertension and practical skills in processing local herbal ingredients, particularly celery, as a natural supplement for blood pressure management.

The results of the pre-test and post-test evaluations demonstrated an improvement in participants' understanding, with the average score increasing from 7.4 to 8.4. This indicates that the program effectively enhanced participants' health literacy and awareness regarding hypertension prevention. Furthermore, the establishment of trained pesantren health cadres represents a sustainable outcome, enabling the pesantren to continue promoting preventive health practices within its community.

This activity also strengthened the collective awareness that maintaining health is both a spiritual and social responsibility, aligning with Islamic values and the principles of community empowerment. It is recommended that similar programs be replicated in other pesantren across Indonesia, accompanied by continuous mentoring and monitoring to ensure long-term sustainability and wider community impact.

Acknowledgments

The authors would like to express their sincere gratitude to the Institute for Research and Community Service (LPPM) of Nahdlatul Ulama University Surabaya for the funding and facilities provided in carrying out this community service program. Deep appreciation is also extended to Darussalam Al-Faisholiyah Islamic Boarding School, Sampang, for their warm welcome, collaboration, and full support throughout the implementation of the activity. The authors would also like to thank the lecturer and student team members for their dedication in preparing, executing, and reporting the program, as well as the pesantren cadres and student participants for their active participation and enthusiasm. Finally, the authors acknowledge all individuals and institutions who contributed to the success of this training activity.

Conflict of Interests

The authors declared that no potential conflicts of interest with respect to the authorship and publication of this article.

REFERENCES

- Anggraini, A. N. (2022). Literature review: Pengaruh pemberian air rebusan seledri terhadap penurunan tekanan darah pada lansia dengan hipertensi.
- Arlianti, A., Muhaimin, T., & Anwar, S. (2019). Pengaruh aktivitas olah raga dan perilaku merokok terhadap hipertensi pada lansia di puskesmas tomomi kecamatan tomomi kabupaten parigi moutong tahun 2019. *Journal of Islamic Nursing*, 4(2), 1-8.
- Hedayati N., Bemani Naeini M., Mohammadinejad A., Mohajeri SA. Efek menguntungkan seledri (*Apium graveolens*) terhadap sindrom metabolik: tinjauan bukti yang ada. *Penelitian Fitoterapi*. 2019;33(12):3040–3053. doi: 10.1002/ptr.6492.
- Jannah, M. (2021). *Seledri: Pengobatan hipertensi*. Penerbit NEM.
- Miftahul, U. (2023). Hubungan antara merokok dan kualitas tidur dengan angka kejadian hipertensi pada pasien lansia (Studi di Puskesmas Ketapang, Kabupaten Sampang) (Doctoral dissertation, STIKES NGUDIA HUSADA MADURA).

- Nuriannisa, F., Kardina, R. N., Putri, P. H., Firdaus, A. A. A., & Aini, Z. A. N. (2023). Peningkatan kapasitas kader pkk dalam memilih makanan sehat untuk mencegah penyakit hipertensi. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 4(6), 11878-11882.
- Organisasi Kesehatan Dunia. Hipertensi [Internet] Jenewa: WHO Press; 2023. <https://www.who.int/news-room/fact-sheets/detail/hypertension>
- Simamora, L., Pinem, S. B., & Fithri, N. (2021). Efektifitas jus seledri terhadap penurunan tekanan darah pada lansia penderita hipertensi di wilayah kerja puskesmas simalingkar. *Journal of Health (JoH)*, 8(2), 67-74.
- World Health Organization. (2023). Hypertension Indonesia 2023 country profile. Surveillance Monitoring and Reporting.
- Yolanda, F. S., Fitri, N. L., & Ludiana, L. (2024). Penerapan rebusan daun seledri (*apium graveolens* l) terhadap tekanan darah pada penderita hipertensi di upkd puskesmas yosomulyo kecamatan metro pusat. *Jurnal Cendikia Muda*, 4(2), 228-237.