Bubungan Tinggi: Jurnal Pengabdian Masyarakat
http://ppjp.ulm.ac.id/journals/index.php/btj/index
e-ISSN: 2722-3043 p-ISSN: 2722-2934
Vol 7 No 3 2025
DOI: https://doi.org/10.20527/btjpm.v7i3.14335

Stroke Risk Prevention in the Community Through Health Education and Blood Pressure Control

Agustina Chriswinda Bura Mare*, Ira Ayu Maryuti, Made Indra Ayu Astarini, and Kristina Pae
Faculty of Nursing, Universitas Katolik Widya Mandala Surabaya, Surabaya, Indonesia
*chriswinda@ukwms.ac.id

Article Info

Article history:
Received: December 15, 2024
Accepted: April 17, 2025
Published: June 1, 2025

Keywords:
Blood pressure
Education
Hypertension
Stroke

This article is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License

© 2025 Bubungan Tinggi: Jurnal Pengabdian Masyarakat

Abstract

Curah Cottok Village is one of the cracker-producing centers in Situbondo City. The main raw material for making crackers is flour, which is processed until dry and then fried in oil. In the production process, salt is also added to enhance the flavor. These factors place the community at a high risk of developing hypertension. Therefore, effective blood pressure management is essential to prevent the risk of stroke. This activity was carried out over two days, from November 29–30, 2024, in Curah Cottok Village, Kapongan District, Situbondo, East Java. During the implementation, the team was assisted by three (3) students. A total of 32 community members participated in the activity. The community benefited from increased knowledge about stroke and its prevention through the introduction of 'SMART' behavior for healthy living. Based on the pre-test results, out of 32 participants, 10 (31.3%) scored between 20 and 40. Post-test results showed that 18 individuals (56.3%) scored 100, indicating that more than half of the participants had gained a solid understanding of stroke risk and prevention. Furthermore, more than half of the participants were found to have hypertension: 12 people (37.5%) had Grade 1 hypertension, and 8 people (25%) had Grade 2 hypertension. It is hoped that the community will begin practicing 'CERDIK' behavior to maintain a healthy lifestyle.

To cite this article: Mare, A. C. B., Maryuti, I. A., Astarini, M. I. A & Pae, K. (2025). Stroke risk prevention in the community through health education and blood pressure control. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat*, *7*(3), 712-718.

INTRODUCTION

Stroke is one of the leading causes of death globally, with one person dying from a stroke every 3 minutes and 14 seconds (CDC, 2020). It is also one of the major causes of long-term disability (Tsao et al., 2022), leading to a significant economic burden on both patients and their families (Honesty & Vetty, 2019). Each year, approximately 15 million people worldwide suffer from strokes, with 5 million of them experiencing permanent disability (World Health Organization (WHO), 2023).

Stroke is a sudden attack on the brain caused by a lack of oxygen supply, resulting in the irreversible death of brain tissue (Karim & Lubis, 2017; Kowalak et al., 2017; Pinzon & Asanti, 2010). This tissue damage leads to permanent disabilities such as visual impairment, slurred speech, mobility issues, and paralysis of the face or limbs. Various risk factors, including lifestyle habits and medical conditions, can trigger a stroke. Lifestyle-related risk factors include being overweight or obese, lack of physical activity,

alcohol consumption, smoking, and the use of illicit drugs such as cocaine and methamphetamines (CDC, 2023; Mayo Clinic, 2017). Meanwhile, medical risk factors include high blood pressure, high cholesterol, diabetes, obstructive sleep apnea, and cardiovascular diseases, such as heart failure, heart infections, or irregular heart rhythms like atrial fibrillation (CDC, 2023; Mayo Clinic, 2017). In addition, age, race, and gender also affect stroke risk.

Hypertension or high blood pressure is the most significant risk factor for stroke in Indonesia (Ambarika et al., 2023; Yudiarto et al., 2017). In 2021, the number of people with hypertension in Situbondo Regency reached 147,167 individuals (26.24% of those aged ≥15 years). In the Kapongan District alone, there were 8,690 individuals diagnosed with hypertension, but only 31.54% (2,754 people) received healthcare services (Dinas Kesehatan Kabupaten Situbondo, 2022). One of the main causes of hypertension is high sodium intake. Excessive salt consumption has been directly correlated with the incidence of hypertension. The prevalence of hypertension in Curah Cottok Village is relatively high. Based on the 2022 community service program, 96% of the 26 participants had blood pressure readings above the normal range (Astarini et al., 2023).

Hypertension can lead to stroke in several ways. It may cause blood clots in the brain and damage small blood vessels deep within the brain, increasing the risk of both ischemic and hemorrhagic strokes. High blood pressure also contributes to the narrowing and hardening of blood vessels, causing a buildup of fatty substances—a process known as atherosclerosis—that can result in clot formation. Additionally, elevated blood pressure can weaken and damage arteries throughout the body, making them more susceptible to rupture or blockage, thereby increasing the risk of stroke.

Curah Cottok Village is known as a cracker-producing center in Situbondo City. The cracker-making process involves flour and salt, which are deep-fried in oil. This dietary pattern puts the local community at high risk for hypertension, making effective blood pressure management critical for stroke prevention.

Stroke prevention efforts can be undertaken through health promotion programs, risk factor control, and encouraging healthy lifestyles (Firmawati, 2024; Laili et al., 2023; Venketasubramanian et al., 2022). Raising awareness about stroke risks is essential to fostering behavior change for risk reduction. Community awareness can begin with education about stroke, its risk factors, and healthy lifestyle practices. It is hoped that through health education and control of risk factors, particularly blood pressure, community awareness of stroke risks can be significantly improved.

METHODS

This community service activity was carried out over two (2) days, from November 29 to 30, 2024, in Curah Cottok Village, Kapongan, Situbondo, East Java. The program adopted a Participatory Action Research (PAR) approach. During the implementation, three (3) university students assisted the team. A total of 32 participants took part in this activity.

On the first day, November 29, 2024, preparations were made, including travel to the location, which took approximately 6 hours. The team coordinated with the village head, local officials, and community members.

On the second day, November 30, 2024, health education sessions focused on stroke and its prevention, along with blood pressure screenings. The health education was delivered through lectures, group discussions, and Q&A sessions. Leaflets were distributed to all participants to support the educational materials.

Blood pressure was measured using a calibrated digital sphygmomanometer. The results were communicated individually to each participant. If a participant's blood

pressure was found to be in the high range (above 140/90 mmHg), they received additional personal counseling on how to manage and control blood pressure. They were also advised to consult a physician for appropriate medical treatment.

The health education program was evaluated using a knowledge questionnaire on stroke, which consisted of five statements regarding stroke symptoms and prevention. The questionnaire was administered before and after the educational session. Data were analyzed using descriptive analysis methods.

RESULTS AND DISCUSSION

Implementing the community service activity in Curah Cottok Village, Kapongan, Situbondo, East Java, went smoothly and successfully. The activity was conducted on November 29–30, 2024, and was attended by 32 participants, all women over 25 and primarily housewives. Participants showed great enthusiasm throughout the activity, which is evident from their active participation in discussions and Q&A sessions during the health education and blood pressure screening.

This activity aimed to raise public awareness of stroke risk, particularly because stroke can now affect younger adults. Stroke risk prevention in this activity was addressed through health education and blood pressure screening. The educational materials covered the definition, symptoms, immediate treatment, and stroke prevention. Stroke risk prevention was promoted through the 'CERDIK' approach, which stands for regular health check-ups, avoiding cigarette smoke, engaging in physical activity, maintaining a healthy and balanced diet, getting adequate rest, and managing stress.

The success of this activity was evaluated using a knowledge questionnaire on stroke prevention, administered before and after the health education. The questionnaire covered three main aspects: definition, symptoms, and stroke risk prevention. In addition, evaluation was also conducted through blood pressure measurements.

The program's outcomes include increased public knowledge about stroke and its prevention. There was a noticeable improvement in knowledge after the education session. Before the session, the pre-test scores ranged from 0 to 80, with no participant achieving a score of 100. After the session, the post-test scores increased to between 80 and 100. The characteristics of the activity participants are listed in Table 1.

Table 1 Participant characteristics (n=32)

Age Group	f	%
25 – 35	4	12.5
36 – 45	2	6.30
46 – 55	5	15.60
56 – 65	8	25.00
>65	13	40.60

Stroke knowledge before and after the test is shown in Table 2.

Table 2 Pre-test and post-test stroke knowledge

Score	Pre-test		Post-test	
	f	%	f	%
0	5	15.6	0	0.0
20	10	31.3	0	0.0
40	10	31.3	0	0.0
60	6	18.8	0	0.0
80	1	3.1	14	43.8
100	0	0.0	18	56.3

Blood pressure results are listed in Table 3.

Table 3 Blood pressure results

Category	f	%
Normal	5	15.6
Pre-hypertension	7	21.9
Hypertension Grade 1	12	37.5
Hypertension Grade 2	8	25.0

Previous studies have shown that health education regarding stroke prevention in individuals with hypertension effectively and efficiently increases knowledge (Suprayitna & Fatmawati, 2021). Similar research focusing on health counseling related to 'CERDIK' behavior and patient compliance has demonstrated positive impacts in preventing recurrent strokes and improving preventive behaviors (Ekawati et al., 2021). Education plays a crucial role in stroke prevention by enhancing knowledge, changing behavior, and encouraging adherence to a healthy lifestyle.

Health education helps individuals identify stroke risk factors such as hypertension, diabetes, smoking, physical inactivity, and unhealthy diets. Understanding these risks encourages people to take preventive action. Hypertension is a major contributing factor to stroke (Nurpitri et al., 2025). It can lead to blood clots in the brain and damage small blood vessels deep within the brain, thereby increasing the risk of both ischemic and hemorrhagic strokes. High blood pressure also narrows and hardens the blood vessels, leading to a buildup of fatty substances known as atherosclerosis, which may cause clot formation. Additionally, hypertension can weaken and damage arteries throughout the body, making them more prone to rupture or blockage, thus further increasing the risk of stroke.

The health education delivered to the community is expected to raise awareness and promote stroke prevention. Stroke can be prevented by adopting the ‘CERDIK’ behavior: regular health checks, avoiding cigarette smoke, routine exercise, a balanced diet, adequate rest, and stress management.

One obstacle encountered during the activity was the microphone malfunction, which made it difficult for elderly participants with hearing impairments to understand the information being shared fully. However, a supporting factor that contributed to the program's success was the enthusiasm of the elderly participants. Despite material delivery limitations, they remained attentive and eager to ask questions.

(a) (b) (c)

Figure 1 (a) The health education session about stroke, (b) The blood pressure screening, and (c) Stroke prevention leaflet

CONCLUSION

The community has benefited from increased knowledge about stroke and its prevention through the 'CERDIK' behavior for healthy living. Based on the pre-test results from 32 participants, 10 individuals (31.3%) scored 20, and another 10 (31.3%) scored 40. Meanwhile, the post-test results showed that 18 individuals (56.3%) out of 32 participants achieved a perfect score 100. This indicates that more than half of the participants have gained an understanding of stroke risks and their prevention. Additionally, more than half of the participants were found to have hypertension, with 12 people (37.5%) classified as having grade 1 hypertension and 8 people (25%) as having grade 2 hypertension.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, ACBM and IA; methodology, MIAA and KP; formal analysis, ACBM; writing—preparation of the original draft, ACBM; and editing IA, MIAA and KP. All authors discussed the result and contributed to the final manuscript.

ACKNOWLEDGMENTS

The Authors are very thankful to LPPM Widya Mandala Catholic University for providing this community service funds.

REFERENCES

Ambarika, R., Saifulaman, M., Hastuti, A. P., & Anggraini, N. A. (2023). Risk factors of stroke in indonesian population: literature review. *Journal Of Nursing Practice*, *7*(1), 133–148. https://doi.org/10.30994/JNP.V7I1.439

Astarini, M. I. A., Maryuti, I. A., & Pae, K. (2023). Upaya pencegahan penyakit hipertensi melalui pemeriksaan tekanan darah dan pendidikan kesehatan pencegahan hipertensi di desa curah cottok, situbondo. *BERDAYA: Jurnal Pendidikan Dan Pengabdian Kepada Masyarakat*, *5*(3), 115–122.

CDC. (2020). *Cdc.Gov Stroke Facts*. Cdc. https://www.cdc.gov/stroke/facts.htm

CDC. (2023). Know your risk for stroke. *Centers for Disease Control and Prevention*. https://www.cdc.gov/stroke/risk_factors.htm

Dinas Kesehatan Kabupaten Situbondo. (2022). *Profil kesehatan kabupaten situbondo tahun 2021*.

Ekawati, F. A., Carolina, Y., Sampe, S. A., & Ganut, S. F. (2021). The efektivitas perilaku cerdik dan patuh untuk mencegah stroke berulang. *Jurnal Ilmiah Kesehatan Sandi Husada*, *10*(1), 118–126. https://doi.org/10.35816/jiskh.v10i1.530

Firmawati, E. (2024). Edukasi kesehatan tentang pencegahan stroke bagi karang taruna di dusun kendangan, sleman. *DEDIKASI SAINTEK Jurnal Pengabdian Masyarakat*, *3*(2), 137–144.

Honesty, F., & Vetty, S. (2019). Beban ekonomi yang ditanggung pasien dan keluarga akibat penyakit stroke : Studi literatur. *Journal of Community Medicine and Public Health*, *35*(6), 193–197.

Karim, U. N., & Lubis, E. (2017). Kualitas hidup pasien stroke dalam perawatan palliative homecare. *JNKI (Jurnal Ners Dan Kebidanan Indonesia)(Indonesian Journal of Nursing and Midwifery)*, *5*(1), 42–50.

Kowalak, J. P., Welsh, W., & Mayer, B. (2017). *Buku ajar patofisiologi* (R. Komalasari, A. O. Tampubolon, & M. Ester (eds.); Bahasa Ind). EGC.

Laili, N., Heni, S., & Tanoto, W. (2023). Optimalisasi program edukasi pencegahan stroke 'cerdik'pada penderita hipertensi. *Jurnal Abdi Kesehatan Dan Kedokteran*, *2*(2), 53–65.

Mayo Clinic. (2017). *Stroke - Symptoms and causes - Mayo Clinic*. Data Acceced: 2021-03-12. https://www.mayoclinic.org/diseases-conditions/stroke/symptoms-causes/syc-20350113

Nurpitri, M. C., Ramadhan, M. D., & Sumarni, T. (2025). Pengaruh pendidikan kesehatan dengan media audiovisual terhadap tingkat pengetahuan stroke pada penderita hipertensi di puskesmas cigugur tengah kota cimahi. *Indonesian Journal of CommunityEmpowerment*, *2*(2).

Pinzon, R., & Asanti, L. (2010). Awas stroke. *Pengertian, Gejala, Tindakan, Perawatan Dan Pencegahan. Andi*.

Suprayitna, M., & Fatmawati, B. R. (2021). Pengaruh pendidikan kesehatan terhadap tingkat pengetahuan pencegahan stroke pada penderita hipertensi. *Jurnal Persatuan Perawat Nasional Indonesia (JPPNI)*, *6*(2), 54. https://doi.org/10.32419/jppni.v6i2.271

Tsao, C. W., Aday, A. W., Almarzooq, Z. I., Alonso, A., Beaton, A. Z., Bittencourt, M. S., Boehme, A. K., Buxton, A. E., Carson, A. P., Commodore-Mensah, Y., Elkind, M. S. V., Evenson, K. R., Eze-Nliam, C., Ferguson, J. F., Generoso, G., Ho, J. E., Kalani, R., Khan, S. S., Kissela, B. M., … Martin, S. S. (2022). Heart disease and stroke statistics-2022 update: A report from the american heart association. *Circulation*, *145*(8), E153–E639. https://doi.org/10.1161/CIR.0000000000001052

Venketasubramanian, N., Yudiarto, F. L., & Tugasworo, D. (2022). Stroke burden and stroke services in indonesia. *Cerebrovascular Diseases Extra*, *12*(1), 53. https://doi.org/10.1159/000524161

World Health Organization (WHO). (2023). *WHO EMRO | Stroke, Cerebrovascular accident | Health topics*. https://www.emro.who.int/health-topics/stroke-cerebrovascular-accident/index.html

Yudiarto, F., Machfoed, M. H., Amir, D., Ong, A., kurniawan, muhammad, Siswanto, S., & Karyana, muhammad. (2017). Hypertension is the most Risk Factor Stroke in Indonesia Stroke Registry (P3.263). *Neurology*, *88*(16_supplement). https://doi.org/10.1212/WNL.88.16_SUPPLEMENT.P3.263

AUTHOR PROFILES

Agustina Chriswinda Bura Mare
chriswinda@ukwms.ac.id
Universitas Katolik Widya Mandala Surabaya
Google scholar ID: UHfRhaIAAAAJ
Sinta ID: 6796486

Ira Ayu Maryuti
iraayu@ukwms.ac.id
Universitas Katolik Widya Mandala Surabaya
Google scholar ID: sgKXKOkAAAAJ
Sinta ID: 6834067

Made Indra Ayu Astarini
madeayu@ukwms.ac.id
Universitas Katolik Widya Mandala Surabaya
Google scholar ID: wv_vnMkAAAAJ
Sinta ID: 6681299

Kristina Pae
kristina@ukwms.ac.id
Universitas Katolik Widya Mandala Surabaya
Google scholar ID: qbzB-AcAAAAJ
Sinta ID: 6702966