



Community-Based Education and Health Screening for Chronic Disease Complications (Stroke and Heart Disease)

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Abstract

Chronic diseases such as stroke and heart disease remain leading causes of morbidity and mortality in Indonesia, particularly among middle-aged and elderly populations. Limited awareness and inadequate routine health screening contribute to delayed detection and complications. This community service program aimed to enhance public knowledge about chronic disease complications and to facilitate early identification of risk factors in Oebobo District, Kupang City. The activity, conducted on March 22, 2025, involved 36 participants aged 30-74 years and included health education sessions, interactive discussions, and basic examinations consisting of blood pressure, blood glucose, cholesterol, and uric acid assessments. A pre test – post test design was used to measure knowledge improvement, while a structured questionnaire assessed participant satisfaction. The results showed a significant increase in knowledge, with mean scores improving from 47.22 to 89.58. Several participants were found to have abnormal clinical indicators requiring further medical evaluation, underscoring the need for accessible community-level screening. Overall satisfaction was very high, with a total score of 37.83 out of 40 (94.57%), reflecting strong acceptance of the activity. Although attendance was affected by unfavorable weather, participants demonstrated high enthusiasm and engagement. In conclusion, this initiative effectively improved community knowledge and supported early detection of chronic disease risk factors. Regular and sustainable implementation is recommended to strengthen preventive health efforts in the population.

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Abstrak

Penyakit kronis seperti stroke dan penyakit jantung masih menjadi penyebab utama morbiditas dan mortalitas di Indonesia, terutama pada kelompok usia paruh baya dan lanjut usia. Rendahnya tingkat kesadaran masyarakat serta kurangnya pemeriksaan kesehatan rutin berkontribusi terhadap keterlambatan deteksi dan meningkatnya risiko terjadinya komplikasi. Program pengabdian kepada masyarakat ini bertujuan untuk meningkatkan pengetahuan masyarakat mengenai komplikasi penyakit kronis (stroke dan penyakit jantung) serta memberikan pemeriksaan kesehatan dasar sebagai upaya deteksi dini faktor risiko di Kecamatan Oebobo, Kota Kupang. Kegiatan dilaksanakan pada tanggal 22 Maret 2025 dengan melibatkan 36 peserta berusia 30-74 tahun. Program ini terdiri atas sesi edukasi kesehatan, diskusi interaktif, serta pemeriksaan kesehatan yang meliputi pengukuran tekanan darah, kadar glukosa darah, kolesterol, dan asam urat. Desain pre-test dan post-test digunakan untuk menilai peningkatan pengetahuan peserta, sedangkan tingkat kepuasan peserta dievaluasi menggunakan kuesioner terstruktur. Hasil kegiatan menunjukkan adanya peningkatan pengetahuan yang signifikan, dengan rerata skor pre-test sebesar 47,22 meningkat menjadi 89,58 pada post-test. Beberapa peserta teridentifikasi memiliki indikator kesehatan yang tidak normal dan memerlukan tindak lanjut medis, yang menunjukkan pentingnya skrining berbasis komunitas. Tingkat kepuasan peserta secara keseluruhan sangat tinggi, dengan total skor evaluasi sebesar 37,83 dari 40 (94,57%), yang mencerminkan penerimaan positif terhadap program ini. Meskipun jumlah kehadiran peserta lebih rendah akibat kondisi cuaca yang kurang mendukung, peserta menunjukkan antusiasme dan keterlibatan aktif selama kegiatan berlangsung. Dengan demikian, program edukasi dan skrining kesehatan ini efektif dalam meningkatkan pengetahuan masyarakat serta memfasilitasi deteksi dini faktor risiko penyakit kronis. Implementasi yang berkelanjutan dan berkala sangat direkomendasikan untuk memperkuat upaya promotif dan preventif di tingkat komunitas.

1. INTRODUCTION

Non-communicable diseases (NCDs), particularly stroke and heart disease, remain leading causes of morbidity and mortality in Indonesia. Epidemiological data indicate that the prevalence of stroke and heart disease has been increasing over the past decade, especially among individuals aged ≥ 30 years (Aparicio et al., 2021). Stroke is consistently reported as one of the main causes of death, while coronary heart disease contributes significantly to the national healthcare burden. These trends are strongly associated with modifiable risk factors such as hypertension, hyperglycemia, dyslipidemia, hyperuricemia, obesity, and sedentary lifestyles (Indonesia Health Survey, 2023).

Recent studies highlight that low health literacy and inadequate routine screening contribute to delayed identification of these risk factors, often resulting in advanced-stage complications. Evidence from community-based studies over the past decade indicates that health education interventions combined with simple screenings such as blood pressure, blood glucose, and lipid assessments can effectively improve knowledge, foster behavioral changes, and increase adherence to preventive practices. Furthermore, community-level promotive and preventive strategies are more cost-effective compared to curative management for advanced-stage NCD complications. (Firmawati et al., 2023; Nurun Salaman Alhidayat, Dwi Esti Handayani, Zakariyati, 2024; Nutbeam & Lloyd, 2021; Saputra, 2024).

Oebobo Subdistrict, Kupang City, is an urban area characterized by demographic heterogeneity, predominantly comprising productive-age adults and pre-elderly populations. (Retnowati, 2021). Socioeconomically, many residents work in the informal sector with limited access to preventive health services. The area also exhibits high population density and varied levels of education and health literacy, which heighten susceptibility to NCDs when early detection and continuous health education are not

routinely practiced. Initial observations and discussions with community leaders indicate that most residents do not undergo regular health check-ups unless symptoms occur. Knowledge related to stroke and heart disease complications tends to focus on acute presentations, with limited understanding of underlying risk factors and long-term preventive measures. Early detection through basic assessments including blood pressure, blood glucose, cholesterol, and uric acid measurements has strong potential to identify at-risk individuals before complications develop.

However, limited community-based interventions integrating both health education and basic screening in this setting remain underexplored. This gap highlights the need for targeted initiatives that translate existing scientific evidence into practical, community-level action. This community service activity builds on previous research examining the relationships among health literacy, self-efficacy, and preventive behaviors related to NCDs. Prior findings emphasize that enhancing knowledge and empowering individuals can significantly improve adherence to risk factor management. Therefore, an intervention combining education and screening was selected to address the identified gap. The objectives of this activity are to improve community knowledge regarding stroke and heart disease complications, identify NCD risk factors through basic health screenings, and promote awareness and motivation for regular check-ups. Through a participatory, community-based approach, this initiative is expected to strengthen promotive and preventive efforts in chronic disease control at the community level.

2. METHOD OF IMPLEMENTATION

This community service activity was conducted using a participatory, community-based approach with a one-group pre-test and post-test design and an educational intervention. This method was chosen to quantitatively assess improvements in community knowledge following the health education intervention and to identify non-communicable disease (NCD) risk factors through basic health screenings. The activity was carried out on March 22, 2025, in Oebobo Subdistrict, Kupang City, involving 36 participants aged 30-74 years. Participants were recruited voluntarily through coordination with local community leaders. Inclusion criteria were: age ≥ 30 years, willingness to participate in all stages of the program, and completion of the provided evaluation instruments.

The implementation consisted of three main phases: preparation, execution, and evaluation. During the preparation phase, coordination was conducted with local authorities and community leaders, initial needs assessment was performed through observation, and educational materials and evaluation instruments were developed based on up-to-date scientific literature on stroke and heart disease. The execution phase included health education and basic health screening. Health education was delivered through interactive lectures, group discussions, and question-and-answer sessions. The content covered risk factors, early signs and symptoms, complications, and preventive strategies for stroke and heart disease through healthy lifestyle modifications. An interactive approach was used to encourage active participation and to foster attitudinal changes regarding the importance of early detection.

Health screenings were conducted after the education session and included blood pressure measurement using a calibrated digital sphygmomanometer, random blood glucose testing, total cholesterol, and uric acid assessment using portable digital devices. Screening results were recorded on observation sheets and communicated directly to participants, accompanied by brief education on result interpretation and follow-up recommendations for values outside the normal range. Program evaluation was performed both quantitatively and qualitatively. Knowledge improvement was measured using a multiple-choice question covering risk factors, complications, and prevention of stroke and heart disease. Scores ranged from 0 to 100, and program success was determined by the difference between mean pre-test and post-test scores. Participant satisfaction was also assessed using a structured question with a 4-point Likert scale, addressing clarity of materials, usefulness of the activity, quality of services, and alignment of the program with community needs. Total scores were converted to percentages to indicate overall acceptance of the program.

Achievement of program objectives was analyzed using several indicators. Cognitively, success was demonstrated by an increase in participants' mean knowledge scores after the intervention. Attitudinally,

success was identified through active participation in discussions, responsiveness to educational content, and commitment to routine health screenings. Socio-culturally, changes were reflected in increased collective awareness of early detection and NCD prevention, as well as willingness to share health information with family and the wider community. Economically, early detection of risk factors through simple screenings is expected to reduce potential future treatment costs associated with chronic disease complications. Quantitative data were analyzed descriptively by calculating means, percentages, and distributions of screening results. Qualitative data were obtained through participant observations and feedback during the program. This approach allows for an objective and comprehensive assessment of the community service outcomes, including knowledge improvement, attitudinal changes, and early identification of chronic disease risk factors.

3. RESULTS AND DISCUSSION

Participant Characteristics

Table 1. Participant Characteristics

Characteristic	Frequency (n)	Percentage (%)
Age		
20-30 years	2	5.56
31-40 years	4	11.11
41-50 years	8	22.22
51-60 years	14	38.88
61-70 years	6	16.67
71-80 years	2	5.56
Gender		
Female	19	52.78
Male	17	47.22
Total	36	100

The age distribution of participants shows that the majority were in the 51–60 years age group (38.88%), followed by 41-50 years (22.22%) and 61-70 years (16.67%). The predominance of pre-elderly and elderly participants aligns with the epidemiological profile of non-communicable diseases (NCDs), particularly cardiovascular disease and stroke, which increase significantly after age 40. A cohort study by (Cockroft et al., 2021) confirmed that stroke incidence rises exponentially in individuals aged ≥ 45 years and is strongly associated with the cumulative effect of risk factors such as hypertension, dyslipidemia, and diabetes mellitus. These findings are consistent with national reports (Indonesia Health Survey, 2023) which indicate increasing prevalence of hypertension, diabetes, and heart disease among adults and older adults. This evidence underscores that community-based promotive and preventive interventions are most strategic when targeting individuals aged ≥ 40 years, as risk factors begin to accumulate and clinical complications start to appear.

Regarding gender, participant involvement was relatively balanced between females (52.78%) and males (47.22%). This balance is important, as literature indicates differences in NCD risk and clinical manifestations between sexes. (Aparicio et al., 2021) reported that males tend to have higher cardiovascular risk at younger ages, whereas females experience increased risk post-menopause due to hormonal and metabolic changes. Therefore, proportional participation of both sexes in this program enhances the likelihood of successful early detection and comprehensive health education. Overall, the participant characteristics demonstrate that the community service activity successfully reached the target population: late productive-age adults and the elderly, who are at higher risk for NCDs. The alignment between participant profiles and epidemiological risk groups reinforces the relevance and potential effectiveness of the implemented health education and screening program.



Figure 1. Participants of the Community Service Activity

Improvement in Participant Knowledge

Table 2. Pre-Post test

Activity	Mean	Minimum	Maximum
Pre-Test	47.22	25	75
Post-Test	89.58	75	100
Total Mean	55.51	40	85

The results of the activity demonstrated an increase in the mean knowledge score from 47.22 in the pre-test to 89.58 in the post-test, with an improvement of 42.36 points. This change indicates that the educational intervention was effective in enhancing participants’ understanding of stroke and heart disease complications. Quantitatively, the substantial score increase over a relatively short intervention period shows that interactive lectures combined with participatory discussions can effectively strengthen the cognitive domain of participants. These findings align with health behavior change theory, which states that knowledge is an initial determinant in shaping attitudes and intentions toward preventive behaviors (Jingyi et al., 2025). Within the Health Promotion model, knowledge acts as a predisposing factor that influences the formation of individual beliefs and readiness to take action.

Moreover, community-based participatory education approaches have been shown to be more effective than one-way educational methods. (Jingyi et al., 2025) reported that community-based cardiovascular education interventions significantly improved both knowledge scores and intentions to undergo routine health screenings among adult and elderly populations. Similarly, (Khan et al., 2021) found that community-based stroke education programs significantly enhanced symptom literacy and early response to stroke warning signs.

Therefore, the significant increase in knowledge scores observed in this activity not only reflects the cognitive success of the educational intervention but also serves as an early indicator of readiness to adopt healthy behaviors within the target community. Continued and sustained educational interventions are strongly recommended to ensure more permanent behavioral changes and to reduce the risk of stroke and heart disease complications at the community level.



Figure 2. Health Education Session Conducted by the Speaker

Health Screening Results

Table 3. Health Screening Results

Type of Examination and Category	Criteria	Frequency (n)	Percentage (%)
Blood Pressure (mmHg)			
Normal	>90-119/ > 60-79	10	27.78
Pre-hypertension	120-139 / 80-89	8	22.22
Hypertension stage 1	140-159 / 90-99	12	33.33
Hypertension stage 2	≥160 / ≥100	6	16.67
Random Blood Glucose (mg/dL)			
Normal	<140	26	72.22
Prediabetes	140-199	8	22.22
High	≥200	2	5.56
Total Cholesterol (mg/dL)			
Normal	<200	21	58.33
High	≥200	15	41.67
Uric Acid (mg/dL)			
Normal	≤7	22	61.11
High	>7	14	38.90
Total		36	100

The health screening results for 36 participants indicated that the proportion of individuals with non-communicable disease (NCD) risk factors remains relatively high, even though most participants fell within the normal range for some parameters. Regarding blood pressure, only 27.78% of participants had values within the normal range, while 22.22% were classified as pre-hypertensive, 33.33% as hypertension stage 1, and 16.67% as hypertension stage 2. These findings indicate that more than half of the participants were in the pre-hypertension or hypertension categories, consistent with other community service studies in Indonesia that reported a high prevalence of hypertension in community settings, associated with lifestyle factors and aging (Asna et al., 2025; Oktora et al., 2024).



Figure 3. Health Screening

Random blood glucose screening showed that the majority of participants were in the normal range (72.22%), while 22.22% were classified as prediabetic and 5.56% had high blood glucose levels (≥ 200 mg/dL). These findings indicate that nearly one-third of participants are at risk of metabolic disorders that could potentially progress to type 2 diabetes mellitus if no further intervention is implemented. Comparative studies on community screenings also emphasize that random blood glucose assessments can help identify at-risk individuals who are often unaware of early metabolic disturbances, highlighting the important role of screening in early detection (Nurmalisa & Pangaribuan, 2025).

The distribution of total cholesterol levels showed that 58.33% of participants were within the normal range (< 200 mg/dL), while 41.67% had elevated total cholesterol (≥ 200 mg/dL). Increased cholesterol levels are a major risk factor for atherosclerosis and coronary heart disease. Findings from other community service screenings similarly indicate that high cholesterol is a common issue among adult populations, requiring targeted interventions through dietary education, physical activity, and regular monitoring (Sugiarti, 2024).

Uric acid assessments revealed that 61.11% of participants had normal levels, whereas 38.90% exhibited elevated uric acid. Hyperuricemia is associated not only with gout but also with metabolic syndrome, which increases the risk of other non-communicable diseases. Therefore, early detection through community-based screening is a critical step to guide participants toward appropriate preventive measures and management strategies (Nurmalisa & Pangaribuan, 2025).

Overall, these screening findings demonstrate that community-based basic health assessments are effective in identifying participants with previously undetected risk factors. In the context of primary prevention, such screening activities allow for appropriate follow-up, including medical referrals, nutrition and lifestyle counseling, or more intensive periodic monitoring by local healthcare facilities. The strength of this screening approach lies in its ability to reach the community at the grassroots level, provide immediate, easily understood results to participants, and serve as a foundation for health education tailored

to individual conditions. Furthermore, these results highlight that even in the absence of clear clinical symptoms, regular assessment of blood pressure, blood glucose, cholesterol, and uric acid remains important, as many non-communicable diseases are “silent” in early stages but still increase the risk of serious complications, such as heart disease and stroke, if left unaddressed (Bintang et al., 2025). Thus, community-based health screening not only raises individual awareness of personal health status but also serves as an effective preventive strategy to reduce the burden of non-communicable diseases at the population level through early detection and timely preventive interventions.



Figure 4. Health Education Activity



Figure 5. Closing of Community Service Program

4. CONCLUSIONS AND RECOMMENDATIONS

This community service program demonstrated a substantial improvement in participants’ knowledge regarding the complications of stroke and heart disease, as evidenced by the significant increase in pre- to post-test scores. Basic health screenings successfully identified individuals with hypertension, elevated blood glucose, high cholesterol, and hyperuricemia, indicating that a considerable proportion of the community is at risk for non-communicable diseases (NCDs). High participant satisfaction and strong engagement further confirm the effectiveness and acceptability of the intervention.

The findings highlight the importance of integrating education and screening as a dual strategy in community-based NCD prevention efforts. Early identification of risk factors enables timely referral and intervention, potentially reducing long-term complications. The positive participant response suggests that community-focused promotive and preventive activities can effectively stimulate awareness, encourage regular health monitoring, and strengthen public participation in disease prevention efforts.

Based on these outcomes, several practical recommendations can be implemented to strengthen future community-based NCD prevention efforts. Regular health education and screening activities should be conducted at least once a year to maintain community awareness and support continuous early detection of NCD risk factors. Expanding the target population to include children and adolescents is also important, as this allows early identification of potential risks while encouraging the adoption of healthy habits from a young age. Furthermore, integrating complementary services such as nutritional counseling, physical activity guidance, and the provision of basic medications can enhance the overall effectiveness of the program and provide more comprehensive preventive care. Strengthening collaboration with local health facilities, particularly community health centers (puskesmas), is essential to ensure proper follow-up for individuals identified with abnormal screening results. In addition, the development and distribution of simple educational materials can help reinforce key health messages and encourage ongoing self-monitoring within households. Through these practical efforts, future programs can achieve greater and more sustainable impact in supporting promotive and preventive strategies against chronic diseases at the community level.

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REFERENCES

- Aparicio, H. J., Benjamin, E. J., Callaway, C. W., Carson, A. P., Cheng, S., Elkind, M. S. V., Evenson, K. R., Ferguson, J. F., Knutson, K. L., Lee, C. D., Lewis, T. T., Loop, M. S., Lutsey, P. L., Mackey, J., & Matchar, D. B. (2021). *Heart Disease and Stroke Statistics 2021 Update A Report From the American Heart Association*. <https://doi.org/10.1161/CIR.0000000000000950>
- Asna, A. F., Trimulyono, A., Kurrohman, F., & Adietya, B. A. (2025). Pemeriksaan Kesehatan Gratis sebagai Upaya Deteksi Dini Penyakit Tidak Menular di Komunitas. *Kolaborasi: Jurnal Pengabdian Masyarakat*, 05(05), 726–736. <https://doi.org/10.56359/kolaborasi.v5i5.633>
- Bintang, Purnamasari, R., Tursinawati, Y., Hajar, N., Kurniati, D., Kedokteran, F., Semarang, U. M., Semarang, K., & Korespondensi, P. (2025). *Skrining dan pemeriksaan kesehatan warga kelurahan sendangmulyo kecamatan tembalang kota semarang*. 2(1), 20–26. <https://doi.org/10.26714/mcej.v2i1.754>
- Cockroft, K. M., Gutierrez, J., Lombardi-hill, D., Kamel, H., Meschia, J. F., Nguyen, T. N., Pollak, P. M., & Santangeli, P. (2021). *Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack* (Issue July). <https://doi.org/10.1161/STR.0000000000000375>
- Firmawati, E., Rochmawati, E., & Setyopranoto, I. (2023). *Community Service : Stroke Risk Detection and Primary Prevention of Stroke Education*. 1(2). <https://doi.org/10.18196/ictced.v1i2.80>
- Indonesia Health Survey. (2023). Penyakit tidak menular. *Survey Kesehatan Indonesia*, 223. <https://www.badankebijakan.kemkes.go.id/hasil-ski-2023/>
- Jingyi, W., Kamaruzaman, S., & Syed, B. (2025). *A Systematic Review of the Relationships Between Attitude , Subjective Norms , Perceived Behavioral Control , and Exercise Intention*. 1–12. <https://doi.org/10.2174/0118749445394456250605043155>
- Khan, F., Allah, R., Gaowgzeh, M., Saif, A. Al, & Chevidikunnan, M. F. (2021). *Effect of Community Education Program on Stroke Symptoms and Treatment on School and College Students from South India : A Longitudinal Observational Study*. <https://doi.org/10.3390/healthcare9121637>
- Nurmalisa, B. E., & Pangaribuan, H. (2025). Reducing Cardiovascular Risk in the Diabetic Community : A Screening and Counseling Program at Talise Health Centre. *Jurnal Pengabdian Masyarakat Lentora*, 5(September), 32–41. <https://doi.org/10.33860/jpml.v5i1.4211>
- Nurun Salaman Alhidayat, Dwi Esti Handayani, Zakariyati, N. H. (2024). Edukasi Pencegahan Serangan Stroke Pada Ibu Rumah Tangga. *Jurnal Pengabdian Pada Masyarakat*, 4, 43–47. <https://doi.org/10.58466/literasi.v4i1.1364>
- Nutbeam, D., & Lloyd, J. E. (2021). *Understanding and Responding to Health Literacy as a Social Determinant of Health*. 159–173.
- Oktora, M. Z., Anggraini, D., Haiga, Y., & Liana, N. (2024). *Skrining Tekanan Darah , Gula Darah , dan Status Gizi sebagai Upaya Pencegahan Penyakit Kronis di Masyarakat*. 25–30. <https://doi.org/10.56260/jurabdikes.v3i1.219>

- Retnowati, R. P. (2021). Profil kesehatan Kota Kupang. *Dinas Kesehatan*, 1(0380), 189. <https://ppid.dinkes-kotakupang.info/informasi-publik/informasi-berkala/profil-kesehatan/profil-kesehatan-kota-kupang-tahun-2021.html>
- Saputra, F. (2024). Edukasi Kesehatan bagi masyarakat dalam Pencegahan Penyakit Hipertensi dan Stroke stroke. *Jurnal Pengabdian Masyarakat Edukasi Indonesia (JPMEI)*, 1, 77–84. <https://doi.org/https://doi.org/10.61099/jpmei.v1i3.53>
- Sugiarti, M. (2024). *Upaya Pencegahan Penyakit Degeneratif melalui Pengendalian Kadar Kolesterol di Desa Srimenanti, Bandar Sribawono, Lampung Timur Preventing Degenerative Diseases Through Cholesterol Management in Srimenanti, Bandar Sribawono, East Lampung*. 6(April 2025), 1–7.