

COMMUNITY SCREENING OF STROKE RISK FACTORS AMONG PRODUCTIVE AGE POPULATION

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ABSTRACT

Stroke is a neurological disease caused by multiple risk factor and can be prevented through early screening and lifestyle modifications. However, the misconception that stroke only affects the elderly leads to low screening interest among younger adults. This community service activity aimed to screen for stroke risk factors, particularly lipid profile examination among the productive age population in the working area of Simpang Sungai Duren Public Health Center. A total of 90 respondents aged 19-59 years participated, most of whom were office workers with sedentary lifestyles and unhealthy dietary habits. The screening included blood pressure measurement, body mass index assessment, total cholesterol and Low-Density Lipoprotein (LDL) levels. All respondents fasted for 8-10 hours before venous blood sampling. Screening results were delivered along with individual consultation and lifestyle education. The results revealed that 20% of respondents had hypercholesterolemia, 22% had elevated LDL levels, 23.26% had hypertension, 21% were overweight, and 39% were obese. These findings indicate that individuals in the productive age group may already have stroke risk factors despite being asymptomatic. Therefore, regular screening from early adulthood is essential as a primary prevention strategy against stroke.

Keywords: stroke, risk factors, screening, productive age

ABSTRAK

Stroke merupakan penyakit neurologis yang disebabkan oleh berbagai faktor risiko dan dapat dicegah melalui skrining serta perubahan gaya hidup sejak dini. Namun, miskonsepsi bahwa stroke hanya menyerang usia lanjut membuat minat skrining pada usia muda masih rendah. Kegiatan pengabdian pada masyarakat ini bertujuan untuk melakukan skrining faktor risiko stroke, khususnya pemeriksaan profil lipid pada masyarakat usia produktif di wilayah kerja Puskesmas Simpang Sungai Duren. Responden berjumlah 90 orang berusia 19-59 tahun, mayoritas merupakan pekerja kantoran yang cenderung menjalani gaya hidup sedentari dan pola makan yang tidak ideal. Skrining meliputi pengukuran tekanan darah, indeks massa tubuh, kadar kolesterol total dan Low-Density Lipoprotein (LDL) dengan prosedur puasa 8-10 jam sebelum pengambilan darah vena. Hasil disampaikan kepada responden disertai sesi konsultasi dan edukasi gaya hidup. Hasil skrining didapatkan 20% responden mengalami hiperkolesterolemia, 22% mengalami peningkatan kadar LDL, 23,26% mengalami hipertensi, 21% berat badan berlebih dan 39% obesitas. Temuan ini menunjukkan bahwa individu usia produktif sudah memiliki faktor risiko stroke meskipun belum menunjukkan gejala, sehingga skrining berkala sejak usia dewasa muda penting dilakukan sebagai upaya pencegahan primer terhadap stroke.

Kata kunci: stroke, faktor risiko, skrining, usia produktif

INTRODUCTION

Stroke is a clinical condition characterized by disfunction of the central nervous system, resulting in focal or global neurological symptoms that persist for more than 24 hours. According to data from Institute for Health Metrics and Evaluation (IHME) in 2019, stroke was the leading cause of death in Indonesia, accounting for 19.42% of total mortality cases.¹ The Basic Health Research (RISKESDAS) report also revealed that the prevalence of stroke in Indonesia increased by 56%, from 7 per 1,000 population in 2013 to 10.9 per 1,000 population in 2018.²

Stroke risk factors are broadly categorized into non-modifiable factors, such as age and genetics, and modifiable ones, which include hypertension, diabetes mellitus and dyslipidemia. Recent studies indicate a growing incidence of stroke among individuals in the productive age group, primarily due to a rise in obesity, hypertension, dyslipidemia and diabetes linked to unhealthy lifestyles. Individuals in this age group are generally expected to be in their peak productive years, with full independence in performing both functional and social activities of daily living (ADLs).³⁻⁵

In Jambi province, dyslipidemia, particularly elevated levels of cholesterol and low-density lipoprotein (LDL), has become a significant public health concern. Increased cholesterol and LDL levels contribute to atherosclerotic plaque formation which may lead to thrombotic or embolic stroke events.^{6,7} Lipid profile screening, along with assessments of blood pressure and body mass index (BMI) plays a critical role in identifying stroke risk factors early, especially as these conditions often present without symptoms.^{8,9}



Health screening among younger populations is particularly important for stroke prevention, as individuals in this group are more likely to engage in unhealthy dietary patterns and low physical activity, which elevate their risk of dyslipidemia, hypertension, and obesity.^{10,11} However, limited access to health examination facilities among the community partners has posed a significant barrier to obtaining adequate healthcare services. Lipid profile assessments available within the community are limited to cholesterol testing using test strips, which are considered insufficient to accurately reflect the individual's metabolic status.

Considering these factors, it is essential to conduct screening for stroke risk factors by measuring total cholesterol, LDL levels, blood pressure and BMI to identify individuals at risk. This initiative also aims to educate the community on the importance of early detection and stroke prevention, particularly in dispelling the common misconception that stroke only affects the elderly. Through this community engagement activity, it is hoped that the incidence of stroke can be reduced and the overall quality of life of the people in Jambi improved.

METHODS

Study Population

This community service activity was conducted in collaboration with the partner institution, UNJA Smart Clinic, located within the working area of Simpang Sungai Duren Public Health Center. The partner area is characterized by a diverse population within the productive age group. A total of 90 respondents aged 19-59 years participated in this program. The community service implementation team consisted of general practitioners and neurologist who are faculty members of the Faculty of Medicine and Health Sciences, Universitas Jambi, with assistance from medical students.

Data Collection

The community service activities were carried out through the following procedures:

1. The team collaborated with the clinic to disseminate information regarding the upcoming activity and opened registration for prospective participants via Google Form link.
2. Registered participants were instructed to fast for 8-10 hours prior to the examination to ensure accurate lipid profile results.
3. On the day of the activity, participants underwent:
 - Blood pressure measurements,
 - Anthropometric assessments including height and weight to calculate BMI
 - Venous blood sampling for laboratory analysis of total cholesterol and LDL levels. Total cholesterol was measured using the Cholesterol Oxidase Para-Aminophenazone (CHOD-PAP) method, while LDL levels were assessed using a direct precipitation method. All blood samples were processed and analyzed at Emerald Clinic Laboratory.
4. Examination results were provided to the participants along with interpretation. During this session, health education on stroke and healthy lifestyle practices was delivered, supported by printed educational materials (leaflet).

RESULTS AND DISCUSSION

The community service activity was conducted over two days, on July 31 and August 1, 2024 involving respondents from the productive age group. The majority of respondents were female, totaling 52 individuals (57.8%), while male respondents accounted for 38 individuals (42.2%). The activity proceeded smoothly due to a solid teamwork and the support of various parties. The respondents demonstrated high enthusiasm throughout the program, as evidenced by their compliance with the fasting requirements prior to the examination and their active engagement in discussions about stroke and healthy lifestyle practices.

Blood pressure assessments revealed that 23 respondents (23.26%) were found to have hypertension, defined as systolic blood pressure >140 mmHg and diastolic pressure >90 mmHg (**Figure 1**). Globally, hypertension is a leading cause of morbidity and mortality due to vascular complications such as stroke. Therefore, early detection through routine screening is crucial for prevention and risk reduction.



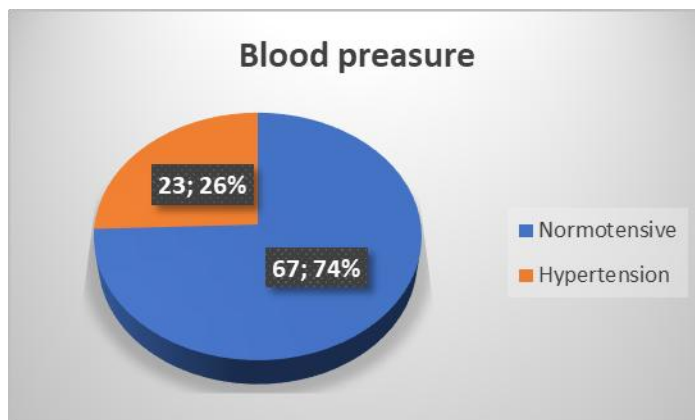


Figure 1. Distribution of blood pressure examination results.

BMI measurements revealed that the majority of respondents were classified as obese (BMI ≥ 27) totaling 35 individuals (39%), while 19 respondents (21%) were categorized as overweight (BMI 25-26.9). The results of the BMI assessment are presented in Figure 2. Obesity has a strong correlation with elevated blood pressure, insulin resistance, and lipid metabolism disorders which are components of metabolic disorders, which collectively increase the risk of stroke.^{12,13} Data from the 2018 RISKESDAS also showed an increasing trend in obesity prevalence among the adult population, reaching 21.8%.¹⁴

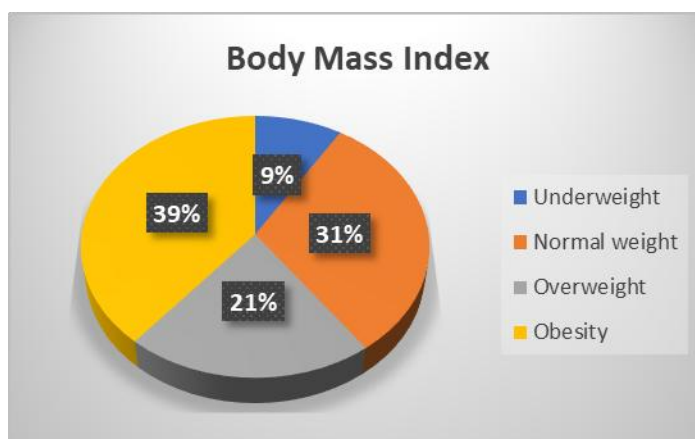


Figure 2. Distribution of Body Mass Index (BMI) results.

Lipid profile examinations revealed that 18 respondents (20%) had hypercholesterolemia, indicated by total cholesterol levels ≥ 200 mg/dL (Figure 3). Meanwhile, 20 respondents (22%) were found to have elevated LDL levels (≥ 130 mg/dL) (Figure 4). Dyslipidemia contributes to the atherosclerotic process, which can trigger ischemic stroke. Previous studies have shown that high LDL levels play a significant role in the formation of atherosclerotic plaques in the carotid and cerebral arteries.¹⁵⁻¹⁸

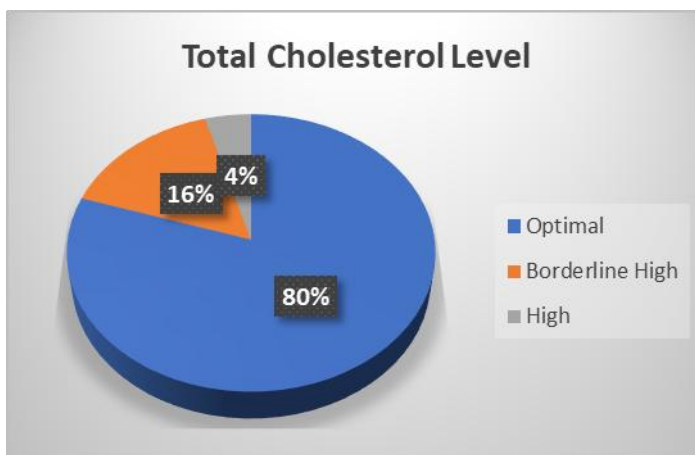


Figure 3. Distribution of total cholesterol level results.



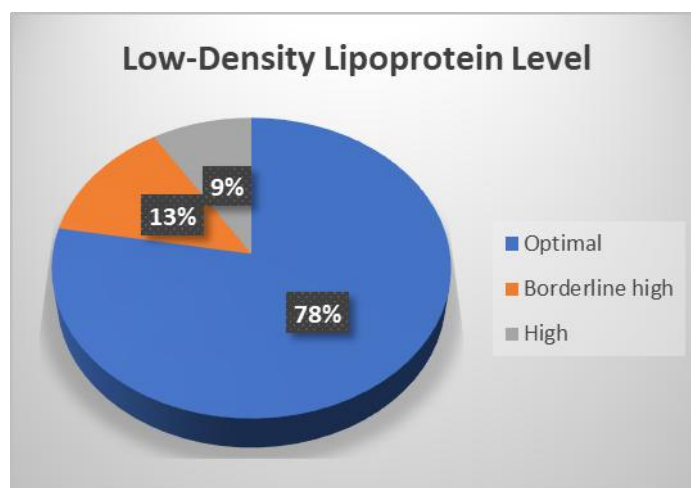


Figure 4. Distribution of Low-Density Lipoprotein (LDL) level results.

Based on the results of this community service activity, several stroke risk factors were identified among individuals in the productive age group. Therefore, the implementation of routine health screening programs is essential for the early detection of these risk factors. Continuous education on healthy eating patterns, regular physical activity and the monitoring of nutritional status, blood pressure and lipid levels is crucial. The limited availability of health screening facilities observed in the partner community highlights the need for a collaborative strategy involving healthcare professionals, government, and local communities to enhance basic health services and prevent stroke and other non-communicable disease.

CONCLUSION

Individuals in the productive age group already exhibit stroke risk factors, even in the absence of clinical symptoms. Thus, routine screening for stroke risk factors is necessary to prevent the onset of stroke.

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