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Community-Based Health Screening for Early Detection of Metabolic Disease Risk Factors among Poskesri Health Cadres in Taeh Baruah, Indonesia

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ABSTRACT

Non-communicable diseases (NCDs) such as diabetes mellitus, dyslipidemia, and hyperuricemia are a rising health burden in Indonesia, yet rural health cadres (kader Poskesri), who act as frontline community health promoters, rarely undergo routine blood profile screening themselves. A free health screening was conducted for 13 Poskesri health cadres in Nagari Taeh Baruah on 30 July 2026. Random blood glucose, total cholesterol, and uric acid were measured using a point-of-care enzymatic stick-test analyzer with capillary blood samples. Data were analyzed descriptively (mean ± standard deviation) and classified against standard clinical thresholds. The mean random blood glucose was 120.3 ± 58.8 mg/dL, total cholesterol 198.5 ± 24.3 mg/dL, and uric acid 5.8 ± 2.3 mg/dL. One participant (7.7%) showed markedly elevated glucose consistent with diabetes, six (46.2%) had borderline-high cholesterol, and four (30.8%) had hyperuricemia. Most cadres showed normal metabolic profiles, but a notable proportion had borderline or elevated cholesterol and uric acid, highlighting the need for sustained NCD screening and lifestyle education among health cadres as role models for the wider community.

Keywords: blood glucose, cholesterol, health cadre, screening, uric acid

INTRODUCTION

Non-communicable diseases (NCDs) such as diabetes mellitus, dyslipidemia, and hyperuricemia are health problems with a continuously increasing prevalence in Indonesia, in line with changes in the population's dietary patterns and lifestyle. Data from the International Diabetes Federation (IDF) in 2024 recorded a diabetes prevalence of 11.3%, or approximately 20.4 million cases, among Indonesian adults, rising sharply from 6.9% in the 2013 Basic Health Research (Riskesdas) to 10.9% in the 2018 Riskesdas (Kementerian Kesehatan RI, 2018; International Diabetes Federation, 2024). This increase has been accompanied by a rise in cases of dyslipidemia and hyperuricemia, which are often overlooked because they are asymptomatic in their early stages (Budiastutik et al., 2022; Karwiti et al., 2023).

Screening of blood glucose, cholesterol, and uric acid levels is one of the early detection efforts for NCDs that has been widely implemented through various community service activities in Indonesia, targeting elderly groups, workers, and the general public alike (Sari et al., 2024; Pulungan et al., 2026; Andini et al., 2025). These programs have

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consistently found that a proportion of participants have blood glucose, cholesterol, and/or uric acid levels above normal, even though most were unaware of their condition prior to examination (Sinaga et al., 2021; Mukaromah et al., 2020). This condition confirms the importance of periodic screening as a form of early detection as well as health education for the community.

Poskesri (Nagari Health Post) health cadres hold a strategic role as drivers and role models for health promotion at the community level. However, health cadres themselves are often a group that rarely receives routine health check-ups because of their busy schedules serving the community, so that their own metabolic health status remains poorly documented (Fitri et al., 2023; Diarti et al., 2023). The health status of community health volunteers is a crucial aspect requiring attention, as it can influence their effectiveness in fulfilling their roles as educators and role models within the community. Volunteers with well-monitored health are expected to convey health promotion messages more effectively and strengthen their credibility in encouraging the adoption of healthy living behaviors among the public. Strengthening the capacity and health monitoring of cadres through NCD screening has been shown to improve cadres' knowledge and skills in detecting NCD risk factors in their respective working areas (Kristianingrum et al., 2024; Prihati & Prasetyorini, 2025).

Based on the description above, this community service activity aims to carry out a free health check-up in the form of screening for random blood glucose, total cholesterol, and uric acid levels among Poskesri health cadres in Nagari Taeh Baruah, while also providing a descriptive and educational overview of the cadres' metabolic status as a basis for promotive and preventive follow-up on NCDs in the area.

METHOD

This community service activity was carried out on 30 July 2026 in Nagari Taeh Baruah, Lima Puluh Kota Regency, West Sumatra Province, as part of the Community Partnership Empowerment Scheme community service program entitled "Medical Radiation Literacy Education to Increase Community Awareness of Early Detection of Breast Cancer through Mammography Examination," carried out by a community service team from Universitas Andalas. The target of this health screening activity was 13 active Poskesri health cadres in the Nagari Taeh Baruah area.

Examination of random blood glucose, total cholesterol, and uric acid levels was carried out using a point-of-care testing (POCT) device based on the enzymatic stick-test method, using capillary blood samples from the fingertips of participants, as is commonly used in community-based NCD screening activities (Diarti et al., 2023; Karwiti et al., 2023).

Before the examination, participants were first given an explanation of the procedure and purpose of the activity, followed by recording of identity data and age. The examination was carried out by a team consisting of lecturers and students from the Physics and Nursing study programs of Universitas Andalas who had been trained in capillary blood sampling techniques and device operation. The examination results were recorded, communicated directly to each participant, and used as the basis for brief health education on diet and healthy lifestyle.

The examination results were analyzed descriptively using data processing software to obtain the mean, standard deviation (SD), minimum, maximum, and median values for each parameter. The examination results were then classified based on standard clinical reference thresholds, namely: normal random blood glucose category <140 mg/dL, prediabetes 140 – 199 mg/dL, and diabetes ⩾200 mg/dL; normal total cholesterol <200 mg/dL, borderline-high 200 – 239 mg/dL, and high ⩾240 mg/dL; and normal uric acid for

women ⩽6.0 mg/dL and hyperuricemia >6.0 mg/dL (Karwiti et al., 2023; Sinaga et al., 2021). The success of the activity was measured by the coverage of participants successfully examined and participants' understanding of the results and follow-up recommendations given.

RESULTS AND DISCUSSION

This free health screening activity was attended by 13 Poskesri health cadres from Nagari Taeh Baruah, aged 26–60 years (mean 40.7 ± 10.2 years). The activity was carried out together with a community service program on medical radiation literacy and early detection of breast cancer through mammography, so that the examination of blood glucose, cholesterol, and uric acid became part of the comprehensive health service provided to the cadres, as shown in Figure 1.



Figure 1. Free health screening activity for Poskesri health cadres as part of a community service program in Nagari Taeh Baruah.

The results of blood glucose, total cholesterol, and uric acid tests conducted by Poskesri health volunteers in Nagari Taeh Baruah are presented in Table 1.

Table 1. Results of random blood glucose, total cholesterol, and uric acid examinations of Poskesri health cadres in Nagari Taeh Baruah (n=13)

No	Cadre Code	Age (yr)	Blood Glucose (mg/dL)	Category	Cholesterol (mg/dL)	Category	Uric Acid (mg/dL)	Category
1	A	51	312	High	219	Borderline	12.6	High
2	B	35	108	Normal	232	Borderline	5.3	Normal
3	C	26	101	Normal	175	Normal	4.8	Normal
4	D	37	91	Normal	153	Normal	3.6	Normal
5	E	26	99	Normal	186	Normal	4.6	Normal
6	F	60	110	Normal	195	Normal	6.9	High
7	G	53	134	Normal	211	Borderline	5.3	Normal

No	Cadre Code	Age (yr)	Blood Glucose (mg/dL)	Category	Cholesterol (mg/dL)	Category	Uric Acid (mg/dL)	Category
8	H	36	100	Normal	167	Normal	6.1	High
9	I	43	84	Normal	197	Normal	5.0	Normal
10	J	46	109	Normal	231	Borderline	4.7	Normal
11	K	39	112	Normal	203	Borderline	7.4	High
12	L	44	98	Normal	220	Borderline	5.5	Normal
13	M	33	106	Normal	192	Normal	4.1	Normal
	Mean ± SD	**40.7**	**120.3 ± 58.8**	**–**	**198.5 ± 24.3**	**–**	**5.8 ± 2.3**	**–**

Note: Random blood glucose category – Normal (<140 mg/dL), Pre-DM/prediabetes (140 – 199 mg/dL), High/diabetes (≥200 mg/dL); Total cholesterol category – Normal (<200 mg/dL), Borderline (200 – 239 mg/dL), High (≥240 mg/dL); Uric acid category – Normal (≤6.0 mg/dL), High/hyperuricemia (>6.0 mg/dL).

Based on Table 1, the mean random blood glucose of participants was 120.3 ± 58.8 mg/dL, with a range of 84–312 mg/dL. As many as 12 participants (92.3%) showed normal blood glucose levels, while one participant (7.7%), who was the oldest in the group, showed a very high blood glucose level (312 mg/dL) indicative of diabetes mellitus. This value was an outlier that significantly increased the group's standard deviation, as seen in the data distribution in Figure 2. This finding is consistent with the increasing prevalence of diabetes among older age groups, which according to IDF data (2024) reaches almost 20% in the 65-and-over age group and 12.8% in the 55–64 age group (International Diabetes Federation, 2024). This finding confirms that simple community-level screening still plays an important role in identifying hidden cases in an apparently healthy population.

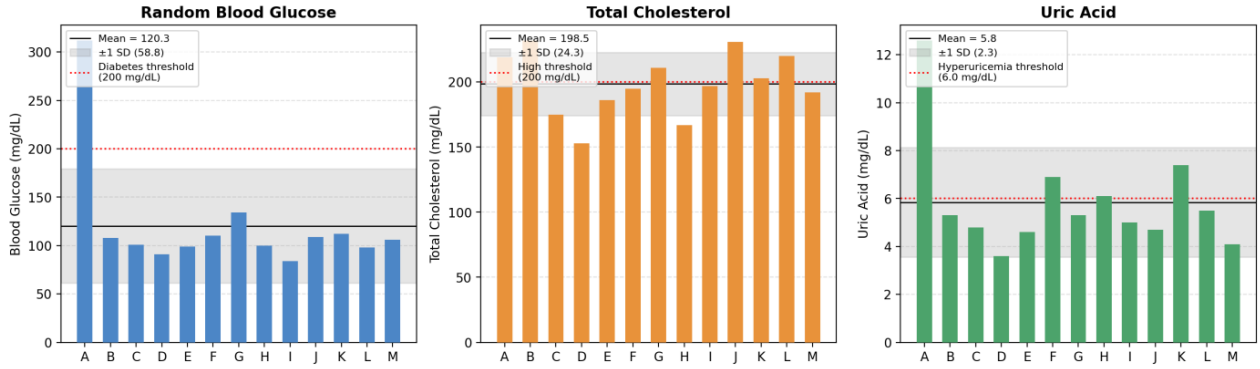


Figure 2. Distribution of participant data relative to the mean ± standard deviation (SD) for (a) random blood glucose (b) total cholesterol (c) uric acid

The mean total cholesterol of participants was 198.5 ± 24.3 mg/dL, with 7 participants (53.8%) in the normal category and 6 participants (46.2%) in the borderline-high category (200–239 mg/dL). No participants were found with cholesterol in the high category (≥240 mg/dL). The proportion of participants with borderline-high cholesterol in this activity was relatively higher than the finding of Andini et al. (2025) in Kambang Iwak Palembang, who reported 9 of 15 participants (60%) with high cholesterol, but is consistent with the general pattern that dyslipidemia is commonly found in productive-age

to pre-elderly groups of women (Karwiti et al., 2023; Sari et al., 2024). Although no cases of high cholesterol (≥240 mg/dL) were found, the borderline condition still needs attention because it has the potential to develop into dyslipidemia if influenced by a diet high in saturated fat, lack of physical activity, and age factors. This is consistent with previous findings that dyslipidemia is often found in productive-age to pre-elderly groups and is often unrecognized because it does not cause symptoms in its early stages.

The uric acid examination showed a mean of 5.8 ± 2.3 mg/dL, with 9 participants (69.2%) in the normal category and 4 participants (30.8%) experiencing hyperuricemia (>6.0 mg/dL). The highest value (12.6 mg/dL) was found in the same participant who had the highest blood glucose level, indicating a possible link between insulin resistance and disturbed purine metabolism, a pattern also observed in other community-based NCD screening activities (Sinaga et al., 2021; Karwiti et al., 2023). Overall, the finding of hyperuricemia in this activity (30.8%) falls within the range reported by various community-based NCD screening activities in Indonesia, which varies between 20–70% depending on the age characteristics and dietary patterns of participants (Sari et al., 2024; Sinaga et al., 2021).

Figure 2 shows that the majority of participants fall within ±1 SD of the mean for all three parameters, except for one participant whose blood glucose and uric acid values far exceeded the upper threshold (outlier). This distribution pattern is also seen in the boxplot in Figure 3, which shows that the distribution of total cholesterol is relatively more evenly spread (a wider interquartile range) compared to blood glucose and uric acid, which tend to be concentrated around normal values with one extreme outlier point.

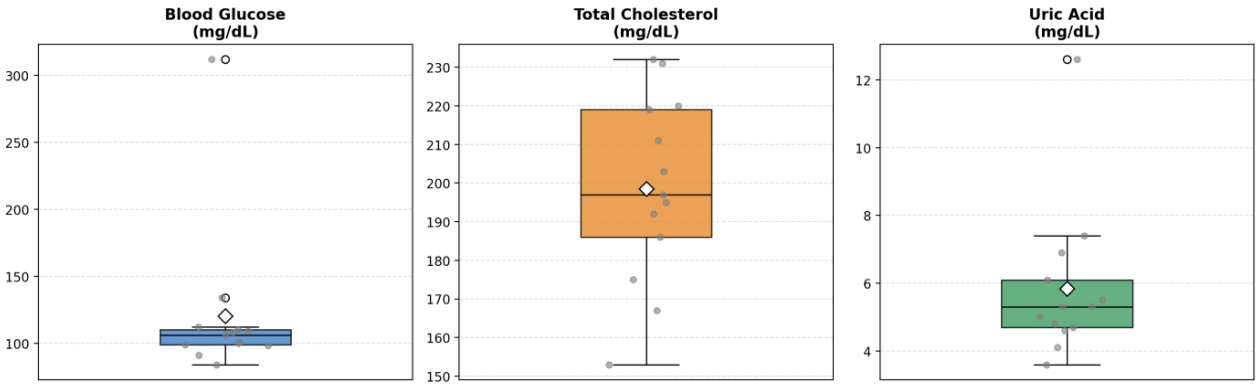


Figure 3. Boxplot of the distribution of random blood glucose, total cholesterol, and uric acid values of participants along with individual data points (n=13).

The proportion of examination result categories is presented more concisely in Figure 4. This donut chart confirms that although the majority of cadres fall into the normal category for all three parameters, nearly half of the participants (46%) have borderline-high cholesterol and nearly a third of participants (31%) have hyperuricemia. This finding is important given that uncontrolled high cholesterol and hyperuricemia are major risk factors for cardiovascular disease and gouty arthritis (World Health Organization, 2023; Karwiti et al., 2023).

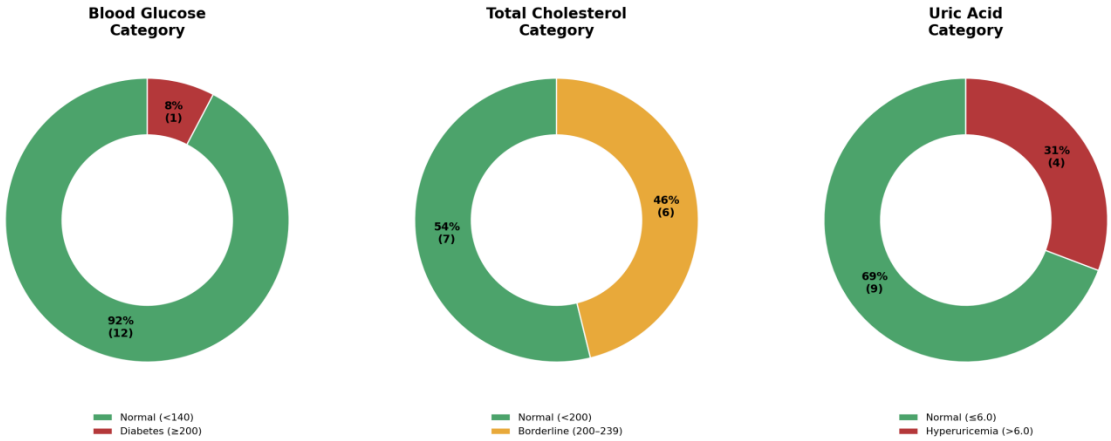


Figure 4. Proportion of random blood glucose, total cholesterol, and uric acid examination result categories among participants (n=13).

To explore the relationship between age and examination results, a simple correlation analysis was carried out and visualized in Figure 5. The results showed a weak-to-moderate positive correlation between age and all three parameters, namely random blood glucose (r=0.38), total cholesterol (r=0.42), and uric acid (r=0.46). This pattern indicates that age contributes to increases in all three metabolic parameters, but is not the sole dominant factor, so that lifestyle, dietary patterns, and physical activity also play an important role and need to be a focus of health education for cadres across age groups (Budiastutik et al., 2022; Azam et al., 2023).

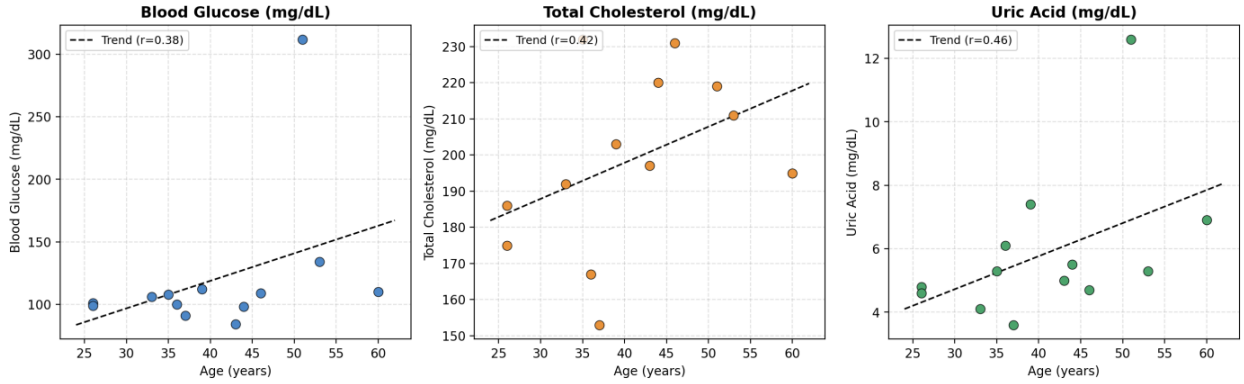


Figure 5. Relationship between age and random blood glucose, total cholesterol, and uric acid levels of participants, with linear trend lines and correlation coefficients (r).

This activity also provided health cadres with direct experience of a simple NCD screening procedure that they can replicate in their respective working areas using similar POCT devices. This is consistent with cadre empowerment strategies for early NCD detection that have been shown to improve cadre capacity in various regions (Diarti et al., 2023; Fitri et al., 2023; Prihati & Prasetyorini, 2025). Documentation of the health screening process in this activity is presented in Figure 6.



(a) (b)

Figure 6. (a) Capillary blood sampling process for blood glucose, cholesterol, and uric acid examination of cadres; (b) Atmosphere of the health screening service attended by cadres and their families at the activity location

Overall, this free health screening activity successfully achieved 100% participant examination coverage, and all participants received feedback on their examination results along with brief education on result interpretation and healthy lifestyle recommendations. The strength of this activity lies in its integration with a broader community service program, reaching cadres directly at their place of work, while its limitation lies in the relatively small sample size (n=13), so the results cannot yet be generalized to the Poskesri cadre population as a whole. This community service activity has important implications because health cadres not only act as implementers of health programs but also as role models for the community. Therefore, the health status of cadres becomes a crucial aspect that can affect the effectiveness of health promotion at the community level. The finding of borderline and abnormal conditions in some cadres indicates the need for an approach that focuses not only on improving cadres' capacity in providing education, but also on regularly monitoring the cadres' own health. Therefore, follow-up is needed in the form of periodic screening (e.g., every 6 months) and referral for participants with abnormal results to the nearest health facility for further examination and management.

CONCLUSION

This free health screening activity for 13 Poskesri health cadres in Nagari Taeh Baruah showed that the participants' mean random blood glucose (120.3 ± 58.8 mg/dL), total cholesterol (198.5 ± 24.3 mg/dL), and uric acid (5.8 ± 2.3 mg/dL) were generally within the normal range. However, one participant (7.7%) showed indications of diabetes, six participants (46.2%) had borderline-high cholesterol, and four participants (30.8%) had hyperuricemia, indicating that the risk of NCDs still needs to be watched for even among a relatively physically active group of health cadres. The strength of this activity lies in its coverage, which integrated three metabolic parameters at once, while its weakness lies in the limited sample size. It is recommended that similar screening activities be carried out periodically and expanded in coverage to all cadres and the community of Nagari Taeh Baruah as part of sustained promotive-preventive efforts against NCDs.

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