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Efforts To Control Hypertension and Diabetes Mellitus Through "SEGER WARAS" Community Visits and the "PINTAR" Calendar in Nguter District

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ABSTRACT

Hypertension and diabetes mellitus are major non-communicable diseases that continue to increase and contribute significantly to morbidity and mortality, particularly in low- and middle-income countries. In the working area of Nguter Primary Health Center, the achievement of standard health services for hypertension and diabetes mellitus has not yet met the Minimum Service Standards. This community engagement activity aimed to improve early detection, community knowledge, and medication adherence through innovative programs, namely the "SEGER WARAS" community visit program (blood pressure and blood glucose screening for healthy citizens) and the "PINTAR" calendar (intensive blood pressure monitoring and routine blood glucose management). The methods included problem identification using health center performance data and interviews, priority setting using the Urgency, Seriousness, and Growth (USG) method, and implementation of screening, education, and community assistance activities. The results showed increased community participation in screening activities, identification of new hypertension and diabetes cases, improved knowledge regarding disease management, and better adherence to routine medication. These programs demonstrate potential as sustainable community-based strategies to strengthen non-communicable disease control at the primary health care level.

Keywords : Community Engagement, Diabetes Mellitus, Hypertension, Medication Adherence, Screening

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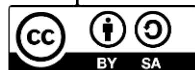

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INTRODUCTION

Non-communicable diseases (NCDs), particularly hypertension and diabetes mellitus, remain major public health challenges worldwide and contribute substantially to morbidity, mortality, and health care costs. The World Health Organization reports that cardiovascular diseases and diabetes are among the leading causes of premature death, especially in low- and middle-income countries. In Indonesia, the prevalence of hypertension and diabetes mellitus continues to increase, as shown by national health surveys, indicating an urgent need for effective preventive and control strategies at the community level (Chow et al., 2013; Mills, Stefanescu, & He, 2020). Hypertension and diabetes mellitus are often referred to as "silent

diseases" because they may remain asymptomatic for long periods. As a result, many individuals are unaware of their condition until complications occur. Limited awareness, low screening coverage, and poor adherence to long-term treatment are persistent challenges in the control of these diseases. At the primary health care level, these challenges are further compounded by barriers such as limited health personnel, time constraints, and difficulties in reaching populations who rarely access health facilities (Sulaiman, Arifin, & Wati, 2021; Chow et al., 2013).

Community-based approaches have been recognized as a key strategy to address these gaps. Bringing screening and education activities directly to the community can reduce access barriers, increase participation, and promote early detection of NCDs. Community engagement not only enhances service coverage but also empowers individuals and families to take an active role in managing their health. Previous studies have shown that community involvement and participatory approaches can improve knowledge, health-seeking behavior, and adherence to treatment among people living with chronic diseases (World Health Organization, 2021; Setiawan, Widodo, & Putri, 2023).

In addition to early detection, effective management of hypertension and diabetes mellitus requires sustained behavior change, including regular medication intake, lifestyle modification, and routine monitoring. However, maintaining adherence to long-term treatment remains a major challenge. Simple, low-cost educational and reminder tools have been shown to support self-care behavior and improve adherence, particularly when they are culturally appropriate and easy to use. Visual media and daily reminder tools can reinforce health messages and facilitate consistent self-monitoring practices at the household level. The SEGER WARAS (Screening Gerakan Warga Sehat) program was developed as a community-based initiative to improve early detection and control of hypertension and diabetes mellitus through regular community visits. This program integrates health screening into existing community gatherings, making preventive services more accessible and acceptable. To complement screening activities, the PINTAR (Pantau Tekanan Darah dan Gula Darah Teratur) calendar was introduced as an educational and monitoring tool designed to support medication adherence and self-monitoring behavior among patients and their families. The integration of community screening and the PINTAR calendar reflects a comprehensive approach that addresses both clinical and behavioral aspects of non-communicable disease control. By combining early detection, health education, and continuous monitoring, this approach aligns with the principles of primary health care, community empowerment, and preventive health services. Such strategies are particularly relevant for primary health centers seeking to strengthen NCD control programs in accordance with national health policies and minimum service standards. Therefore, this study aims to describe and analyze the implementation of the SEGER WARAS community visits and the use of the PINTAR calendar in Nguter District as a community engagement effort to control hypertension and diabetes mellitus.

METHOD

This community engagement activity was conducted in the working area of Nguter Primary Health Center, Sukoharjo Regency, Indonesia. The target population included residents aged 15 years and above, both undiagnosed individuals and patients with diagnosed hypertension or diabetes mellitus. Problem identification was performed using secondary data from the Primary Health Center Performance Assessment, Minimum Service Standard reports, and interviews with non-communicable disease program officers. Priority problems were determined using the Urgency, Seriousness, and Growth (USG) method. Through innovative

programs The SEGER WARAS program in five villages within the working area of Nguter Primary Health Center. The intervention consisted of community-based screening for blood pressure and blood glucose, health education sessions, and distribution of the PINTAR calendar as a monitoring and educational tool. Program monitoring and evaluation were conducted through participation records, screening results, and follow-up observation of medication adherence. The PINTAR calendar here refers to the Regular Monitoring of Blood Pressure and Blood Sugar in the Nguter Community Health Center Service Area – Sukoharjo.

Table 1. Example of PINTAR Calendar Monitoring Participations

Date	Taking Medication	Blood Pressure (mmHg)	Blood Sugar Levels (mg/dL)	Status	Notes
1	✓	130/85	140	W	-
2	✓	120/80	110	N	-
3	✗	-	-	No	Forgot
4	✓	150/95	190	H	Control
5	✓	135/88	145	W	-

Status guide:
✓ = Yes taking medication
✗ = No taking medication
N = Normal/Under control
W = Warning/Caution advised
H = High (Go to the health center immediately)
No = No data / Not taking medication

Daily Checklist (Supporting Compliance – based on findings showing an increase from 61% to 84%):

Every day, patients check off:

☐ Take medication
☐ Check blood pressure
☐ Check blood sugar
☐ Get at least 30 minutes of physical activity
☐ Cut back on salt and sugar

Table 2. Weekly Summary (Optional – subject to program evaluation) :

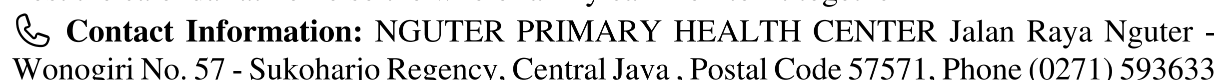
Week	Regular Medication Intake	Notes
1	6 out of 7 days	Good
2	7 out of 7 days	Very Good
3	5 out of 7 days	Needs Improvement

Educational Message (Strengthening the Awareness Program)

- Hypertension and diabetes are often asymptomatic
- Take your medication every day, even if you feel healthy
- Get regular checkups at the Nguter Community Health Center
- Early detection prevents complications

Family Involvement

Post the calendar at home so the whole family can monitor it together



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RESULTS

The SEGER WARAS program was implemented in five villages within the working area of Nguter Primary Health Center. Community screening activities were conducted during routine community meetings, village forums, and integrated health posts. A total of 327 residents aged ≥15 years participated in blood pressure and blood glucose screening activities. Among screened participants, several previously undiagnosed cases of hypertension and diabetes mellitus were identified, enabling early referral and initiation of management at the primary health care level.

The implementation of the SEGER WARAS program resulted in increased participation of community members in blood pressure and blood glucose screening activities across several villages. New cases of hypertension and diabetes mellitus were identified, allowing early referral and management. The PINTAR calendar was well accepted by patients and families, facilitating routine medication intake and self-monitoring. Overall, the intervention improved screening coverage and strengthened community awareness regarding non-communicable disease prevention and control.

Table 3. SEGER WARAS Program Implementation Overview

Activity Timeline

Date	Activity	Duration	Evaluation
3–7 Mar 2025	Community Screening (BP & Glucose)	5 days	Follow-up 10–14 Mar
3–7 Mar 2025	Health Education & PINTAR Calendar Distribution	Concurrent	Observed adherence 10–14 Apr
10–14 Apr 2025	Follow-up Visits	5 days	Data collection for Table 2 & 3

Implementation Activities – Suggested Pictures

Activity	Description
Community Screening	Residents having blood pressure and blood glucose measured at community meetings or health posts. Include health workers checking BP/glucose and tables for registration.
Health Education	A health worker explaining chronic disease management using flipcharts or posters, pointing to the PINTAR calendar.
PINTAR Calendar Use	Patients/families filling in daily medication intake and BP/glucose readings in the calendar at home. Show calendar on wall or table with visual indicators.
Follow-up Visits	Health workers reviewing completed calendars, giving feedback or counseling, and recording results in the clinic register.

Key Quantitative Results (to include in visual)

- Total Participants: 327 residents ≥15 years
- Hypertension Detected: 102 cases
- Diabetes Detected: 33 cases
- New Cases Identified: 45 cases

Screening Coverage by Village

Village	Participants	Hypertension	Diabetes	New Cases DM
Nguter	68	21	7	9
Celep	61	18	6	8
Pengkol	70	24	8	11
Jangglengan	59	17	5	7
Kedungwinong	69	22	7	10

PINTAR Calendar Outcomes:

Indicator	Before	After	Change
Patients receiving calendar	–	214	+214
Regular medication adherence	61%	84%	+23%
Routine BP/Glucose recording	34%	79%	+45%

Visual Summary:
The infographic includes:

- Activity implementation: screening, education, follow-up
- Duration & dates: 5 days of screening, 5 days of follow-up
- Outcome evaluation: medication adherence and routine documentation
- Effectiveness of educational tools: The PINTAR calendar increases participation and disease management

Table 4. Coverage of SEGER WARAS Community Screening Activities

Village	Participants (n)	Hypertension Detected	Diabetes Detected	New Cases DM	Remainder (No new diagnosis)
Nguter	68	21	7	9	31
Celep	61	18	6	8	29
Pengkol	70	24	8	11	27
Jangglengan	59	17	5	7	30
Kedungwinong	69	22	7	10	30
Total	327	102	33	45	147

Narrative: Table 1 shows the distribution of community screening activities across five villages. The results indicate substantial community participation and successful identification of new hypertension and diabetes mellitus cases through integrated screening during community events. Remainder = Participants – (Hypertension + Diabetes + New Cases DM). Represents participants who either had normal BP and glucose, previously diagnosed but controlled conditions, did not meet the criteria for a new case.

Table 5. Distribution and Utilization of the PINTAR Calendar

Indicator	Target	Diagnosed Patients (n)	Undiagnosed Participants (n)	Notes
Calendars distributed	250 patients	214	0	Only diagnosed patients received the calendar

Indicator	Target	Diagnosed Patients (n)	Undiagnosed Participants (n)	Notes
Participants receiving education	250	214	113	Education provided to all participants, including undiagnosed
Patients using the calendar regularly	230	198	–	Only diagnosed patients tracked BP/glucose and medication
Patients with improved medication adherence	230	190	–	Measured only for patients taking medication regularly

Narrative: Diagnosed Patients: Individuals with known or newly detected hypertension or diabetes. They received the PINTAR calendar and were the focus of medication adherence and BP/glucose self-monitoring. Undiagnosed Participants: Individuals without hypertension or diabetes. They did not receive the calendar, but did receive health education to raise awareness and promote healthy behaviors. Adherence and routine monitoring outcomes apply only to diagnosed patients, as undiagnosed participants are not on medication.

Table 6. Improvements in Medication Adherence

Indicator	Before Program	After Program	Change
Patients receiving calendar	-	214	+214
Regular medication adherence	61%	84%	+23%
Routine BP/Glucose recording	34%	79%	+45%

Narrative: Table 4 illustrates improvements in medication adherence and self-monitoring behavior among patients with hypertension and diabetes mellitus after the introduction of the PINTAR calendar. The calendar functioned as both an educational medium and a practical reminder tool, strengthening patient engagement.

Table 7. Distribution and Utilization of the PINTAR Calendar

Indicator	Target	Achievement	Remarks
Calendars distributed	250 participants	230 participants	92% coverage
Participants receiving education	250 participants	230 participants	Integrated with distribution
Participants using calendar routinely	230 participants	198 participants	86% adherence
Participants with improved medication adherence	230 participants	190 participants	Observed during follow-up

Narrative: Table 5 describes the distribution and utilization of the PINTAR calendar. Most participants used the calendar consistently as a reminder for medication intake and recording

blood pressure or blood glucose results. This contributed to improved adherence and better communication between patients, families, and health workers. The participants who indicate substantial community participation and successful identification of new hypertension and diabetes mellitus cases through integrated screening during checking. Participants are the people who undiagnosed hypertension or DM.

The PINTAR Calendar is provided only to patients who have been diagnosed with hypertension or diabetes mellitus, whether previously diagnosed or newly diagnosed. Participants who have not yet been diagnosed will still receive health education, but they are not included in medication adherence monitoring or routine blood pressure/blood glucose monitoring, as they are not yet taking medication. The implementation of the SEGER WARAS program demonstrates that a community-based approach is effective in improving the early detection of hypertension and diabetes mellitus, including previously undiagnosed new cases. The distribution of PINTAR calendars to diagnosed patients successfully increased medication adherence from 61% to 84% and the routine monitoring of blood pressure and blood sugar levels from 34% to 79%. Meanwhile, community education provided alongside the calendar distribution reached undiagnosed participants, thereby increasing knowledge and awareness to approximately 92%. These findings indicate that the integration of community-based screening, education, and monitoring not only strengthens patients' self-management but also enhances overall community awareness and supports the strengthening of non-communicable disease control programs at the community health center level, in line with the principles of community empowerment and sustainable primary prevention.

DISCUSSION

The findings of this community engagement activity demonstrate that integrating health screening and education into routine community gatherings is an effective strategy to improve early detection and management of hypertension and diabetes mellitus at the primary health care level (Damayanti, Putri, & Nugroho, 2023; Setiawan, Widodo, & Putri, 2023). The SEGER WARAS program successfully increased community participation in blood pressure and blood glucose screening, as reflected by the high number of participants across five villages. This finding supports the notion that bringing services closer to the community reduces access barriers and encourages individuals who may not routinely visit health facilities to participate in preventive health activities (Sulaiman, Arifin, & Wati, 2021; Chow et al., 2013).

The identification of new cases of hypertension and diabetes mellitus through SEGER WARAS visits highlights the importance of active case finding in the community. Many participants were previously undiagnosed, which is consistent with evidence that hypertension and diabetes are often asymptomatic in their early stages (World Health Organization, 2021; NCD Risk Factor Collaboration [NCD-RisC], 2021). Community-based screening has been widely reported as an effective approach to uncover hidden cases of non-communicable diseases, particularly in low- and middle-income settings where awareness and routine health checks remain limited (Chow et al., 2013; Mills, Stefanescu, & He, 2020). Early detection enables timely referral and initiation of management, thereby reducing the risk of complications and long-term health costs (Rahmawati, Sari, & Hidayat, 2021; Rif'at, Hasneli, & Indriati, 2023).

In addition to screening, the PINTAR calendar played a crucial role in improving medication adherence and self-monitoring behavior among patients with hypertension and diabetes mellitus. The substantial increase in regular medication adherence and routine recording of blood pressure and blood glucose values indicates that simple, low-cost

educational tools can significantly influence patient behavior (Bosworth et al., 2011; Burnier & Egan, 2019; Nugroho, Lestari, & Prasetyo, 2022). The calendar functioned not only as a reminder for medication intake but also as a visual and practical medium for health education, reinforcing key messages on disease management throughout the year (Hallberg et al., 2018; Perkumpulan Endokrinologi Indonesia, 2021).

The improvement in adherence observed in this program aligns with previous studies showing that reminder-based interventions and patient-centered educational media are effective in enhancing self-care behaviors in chronic disease management (Bosworth et al., 2011; Burnier & Egan, 2019). Family involvement, which was encouraged through the visible placement and shared use of the calendar at home, may have further contributed to improved adherence (Rahmawati, Sari, & Hidayat, 2021). This finding emphasizes the role of family and social support in sustaining long-term behavioral change among patients with chronic conditions (Stanifer et al., 2020).

Furthermore, the integration of the PINTAR calendar into routine community health activities strengthened communication between patients, families, community health volunteers, and primary health care providers. This collaborative approach supports continuity of care and enhances patient engagement, which are key components of effective non-communicable disease control (Kementerian Kesehatan RI, 2020; Setiawan, Widodo, & Putri, 2023). By combining screening, education, and monitoring into a single integrated approach, the program addressed both clinical and behavioral aspects of hypertension and diabetes management (James et al., 2014; American Diabetes Association, 2024).

From a public health perspective, the SEGER WARAS and PINTAR calendar programs demonstrate a scalable and sustainable model for community-based non-communicable disease control. The use of existing community forums and local health resources minimized additional costs and facilitated program acceptance (Setiawan, Widodo, & Putri, 2023; Sulaiman, Arifin, & Wati, 2021). These characteristics are particularly important for primary health centers seeking to improve service coverage in line with Minimum Service Standards and national performance indicators (Kementerian Kesehatan RI, 2022; Kementerian Kesehatan RI, 2024).

Despite these positive outcomes, this activity has several limitations. The evaluation relied primarily on short-term outcomes and self-reported adherence, which may be subject to reporting bias. In addition, the absence of a control group limits the ability to attribute all observed improvements solely to the intervention. Future programs should incorporate longer follow-up periods and objective clinical indicators to assess the sustained impact of community-based interventions on disease control (Damayanti, Putri, & Nugroho, 2023; Nugroho, Lestari, & Prasetyo, 2022).

Overall, the results suggest that community engagement strategies that combine active screening with practical educational tools can significantly enhance early detection, adherence, and awareness of hypertension and diabetes mellitus. Such approaches are well aligned with the principles of primary health care and community empowerment and can contribute meaningfully to strengthening non-communicable disease control programs at the local level (World Health Organization, 2021; Setiawan, Widodo, & Putri, 2023).

CONCLUSION

The SEGER WARAS community visit program combined with the PINTAR calendar was effective in improving screening coverage, health knowledge, and medication adherence among individuals with hypertension and diabetes mellitus. This integrated, community-based

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approach demonstrates a practical and scalable strategy for strengthening non-communicable disease control at the primary health care level, particularly in resource-limited settings.

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