Krepa: Kreativitas Pada Abdimas
ISSN 2988-3059
Cahaya Ilmu Bangsa

Vol 7 No 6 Tahun 2026
Prefix DOI : 10.9765/Krepa.V218.3784

INNOVATION OF *KOPI DI ATI* IN ENHANCING DIABETES AND HYPERTENSION CASE FINDING AT TANJUNG PALAS BARAT SUBDISTRICT

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ABSTRACT

Introduction: Diabetes mellitus and hypertension are among the leading causes of mortality and morbidity. Primary Health Centers, as First-Level Health Facilities, play a crucial role in addressing community health problems. Limited public knowledge regarding diabetes and hypertension, along with low community participation in visiting Integrated Non-Communicable Disease Posts (*Posbindu*), encouraged the authors to develop an innovation known as "*KOPI DI ATI*" *Kenali Risiko Penyakit Diabetes dan Hipertensi* (Understanding the Risk of Diabetes and Hypertension) at Tanjung Palas Barat Subdistrict.
Methods: The "*KOPI DI ATI*" innovation integrates two activities into a single program, cooking demonstrations and health education on diabetes and hypertension. This innovation aims to improve disease control among patients with diabetes and hypertension in order to enhance quality of life through the adoption of healthy lifestyles. The activities were conducted at Posbindu to increase community interest and participation in attending Posbindu services.
Results: The implementation of the *KOPI DI ATI* innovation resulted in an increase in Non-Communicable Disease (NCD) screening coverage and the detection of diabetes and hypertension cases. There were statistically significant differences in random blood glucose levels and systolic blood pressure before and after the *KOPI DI ATI* intervention.
Conclusion: The *KOPI DI ATI* innovation improved community knowledge regarding diabetes and hypertension and indirectly contributed to increased NCD screening coverage and the identification of new cases of diabetes and hypertension.
Keywords: Innovation, KOPI DI ATI, diabetes, hypertension

Article History
Received: Januari 2026
Reviewed: Januari 2026
Published: Januari 2026

Plagiarism Checker No 234.KK.443
Prefix DOI :
10.9765/Krepa.V218.3784
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Publish by : Krepa



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INTRODUCTION

In recent years, disease trends have shifted toward non-communicable diseases (NCDs). Diseases that require particular attention are diabetes mellitus and hypertension. The prevalence of both conditions continues to increase annually, and although they cannot be cured, they can be effectively controlled through appropriate management.(I Putu *et al*, 2021)

Diabetes mellitus and hypertension are among the leading causes of mortality and morbidity. According to the World Health Organization (WHO) report in 2016, of the 56.9 million

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deaths worldwide, 15.2 million were attributed to hypertension. In addition, WHO has predicted a substantial increase in the number of patients with type 2 diabetes mellitus in the coming years. In Indonesia, the number of patients with type 2 diabetes mellitus is projected to increase from 8.4 million in 2000 to approximately 21.3 million by 2030. Furthermore, data from the International Diabetes Federation (IDF) indicate that the number of people with diabetes increased from 10.3 million to 16.7 million between 2013 and 2017 and is projected to reach this figure by 2045. Indonesia ranked sixth among countries with the highest number of diabetes cases globally, with 10.3 million patients reported in 2017.

Based on data from the Indonesian Ministry of Health in 2018, the prevalence of diabetes in North Kalimantan Province was 1.6% (1.3–2.0), while the prevalence of hypertension reached 10.46% (9.25–11.80). North Kalimantan is among the five provinces with the highest prevalence of hypertension, heart disease, and stroke. Meanwhile, in Bulungan Regency in 2021, the number of reported cases was 5,515 for diabetes mellitus and 23,031 for hypertension.

The control of non-communicable diseases is one of the four priority areas of the program.(Kemenkes RI, 2016) However, in practice, efforts to control NCDs remain limited, particularly in the management of diabetes mellitus and hypertension. Primary Health Centers, as First-Level Health Facilities, play a vital role in addressing public health problems at the community level. Health services at Primary Health Centers should not be limited to curative care alone; promotive and preventive services must also be continuously strengthened. At the Long Beluah Primary Health Center, there is no specific program dedicated to addressing diabetes and hypertension. Existing promotive and preventive activities, such as the Integrated Non-Communicable Disease Post (Posbindu PTM), have not been optimally implemented. Community participation in Posbindu activities remained low, with only 17 participants (0.36%).

Low community attendance at Posbindu is consistent with the inadequate coverage of NCD screening at the Long Beluah Primary Health Center, which has not met the national target indicator of 100%. Based on program records and reports from 2020, NCD screening coverage was only 0.36%, with diabetes case detection reaching 45% and hypertension case detection 22.3%.

The management of diabetes and hypertension cases at Tanjung Palas Barat Subdisctrict as the working area of the Long Beluah Primary Health Center has so far been limited to conventional approaches, with no specific innovations developed for NCD control, particularly for diabetes and hypertension. Therefore, the author was motivated to develop an innovation known as "*KOPI DI ATI*" *Kenali Risiko Penyakit Diabetes dan Hipertensi* (Understanding the Risk of Diabetes and Hypertension).

METHOD

The "*KOPI DI ATI*" program, which comprises diet-appropriate cooking demonstrations and health education for patients with diabetes and hypertension, has been implemented since 2021 through collaboration with other professional groups, including nutritionists and the other health workers, in accordance with their respective roles and responsibilities. This innovation has been implemented in Tanjung Palas Subdistrict, specifically in Long Beluah, Long Sam, and Long Pari Village.

KOPI DI ATI integrates two activities into a single program, cooking demonstrations and educational counseling on diabetes and hypertension. This innovation aims to improve disease control among patients with diabetes and hypertension and to enhance their quality of life through the adoption of a healthy lifestyle.

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The cooking demonstrations are conducted alongside educational sessions that focus on appropriate food preparation for patients with diabetes and hypertension. Menu selection for the demonstrations is determined through collaboration with nutritionists. The foods prepared during the cooking demonstrations are locally sourced foods that are readily available in Long Beluah Village and the surrounding areas of West Tanjung Palas District. In addition, education is provided on the appropriate use of salt and sugar in daily cooking based on physiological requirements.

For example, the recommended daily salt intake under normal conditions should be limited to a maximum of 5 grams per day (approximately one teaspoon of table salt). For patients with hypertension, salt intake should be further restricted to 3.5–4 grams per day. Meanwhile, the recommended daily sugar intake under normal conditions is a maximum of 50 grams per day, equivalent to four tablespoons. This includes white sugar, palm sugar, and sugars derived from other sources such as carbohydrates (e.g., rice, potatoes, and sweet potatoes).

The cooking demonstration and educational activities for diabetes and hypertension are conducted regularly, at least once every two months. Collaboration with nutritionists includes nutritional value calculations and recommendations on the appropriate selection of raw ingredients for cooking demonstrations and health education sessions, ensuring that the food presented meets the dietary needs of patients with diabetes mellitus and hypertension. Locally available foods in Long Beluah Village, such as *Kalo* fish, *Sayen* fish, tubers, and other local ingredients, are utilized in the cooking demonstration menus.

Kalo fish, a local freshwater fish found exclusively in Long Beluah Village, is comparable to gourami fish, differing primarily in habitat. *Kalo* fish inhabits freshwater environments, whereas gourami fish can be found in both freshwater and brackish or saltwater habitats.

Per 100 grams of cooked *Kalo* fish, the nutritional content includes approximately 192 kcal of energy, 13 grams of protein, 13 grams of carbohydrates, 10 grams of fat, 283 milligrams of calcium, 169 milligrams of phosphorus, 1 milligram of iron, and 19 micrograms of retinol. As a freshwater fish, *Kalo* fish also contains omega-3 fatty acids, although in relatively low amounts. These nutritional components are considered beneficial in reducing the risk of hypertension, while the low carbohydrate content makes *Kalo* fish a safe protein source for patients with diabetes mellitus.

Health education related to physical activity (aerobic exercise) was implemented through collaboration with occupational health and sports officers. This activity involved instruction and direct practice of simple exercise movements that are easy to perform independently at home. The intervention aimed to improve blood circulation and increase physical activity levels, thereby encouraging patients with diabetes mellitus and hypertension to actively maintain their physical fitness.

Patients' random blood glucose levels and blood pressure were measured prior to the *KOPI DI ATI* intervention and after one year of participation in the *KOPI DI ATI* program. The examination results were subsequently analyzed using Statistical Package for the Social Sciences (SPSS) software. A paired t-test was applied to assess differences in clinical parameters before and after the intervention.

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Figure 1. *KOPI DI ATI* innovation; cooking demo, education, medical check-up, exercise

RESULTS & DISCUSSION

Following the implementation of the *KOPI DI ATI* innovation, participants regularly received information and activities related to cooking demonstrations and physical activity education (exercise) at least once every two months. Participant attendance at the Posbindu increased substantially, reaching 30–40 participants per visit, compared to only 15–20 participants prior to the implementation of the *KOPI DI ATI* program.

These findings were supported by an increase in non-communicable disease (NCD) screening coverage. NCD screening coverage was 8.72% in 2021 and increased to 59.7% in 2022, representing an absolute increase of 50.98%. This indicates that *KOPI DI ATI* was effective in increasing community interest in undergoing regular health check-ups at Posbindu.

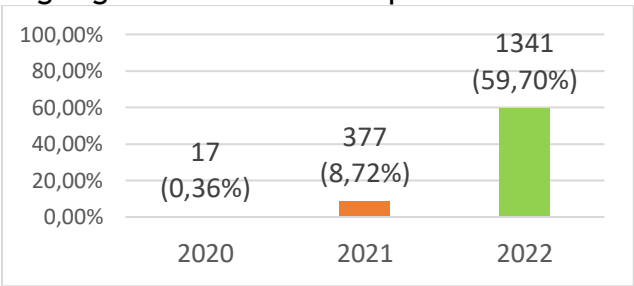


Figure 2. The Chart of Coverage of Non-Communicable Disease (NCD) Screening in Tanjung Palas Barat Subdisctrict, 2020–2022

In addition, the coverage of case detection for diabetes mellitus and hypertension in Tanjung Palas Barat Subdistrict from 2022 to 2024 also showed an increase compared to previous years. Comparative data on diabetes and hypertension case detection coverage from 2020 to 2024 are presented in the figure below.

Based on the figure, diabetes case detection coverage increased from 51.37% prior to the implementation of *KOPI DI ATI* to 95% after the program was implemented, with a consistent

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upward trend in subsequent years, had reached 122.6% in 2024. Similarly, hypertension case detection coverage increased from 34.54% in 2021 to 79% in 2022, and continued to rise through 2024 (90.64%). These findings indicate that the implementation of the KOPI DI ATI innovation indirectly contributed to improvements in NCD screening coverage as well as increased case detection of diabetes mellitus and hypertension within the working area of Long Beluah Primary Health Center.

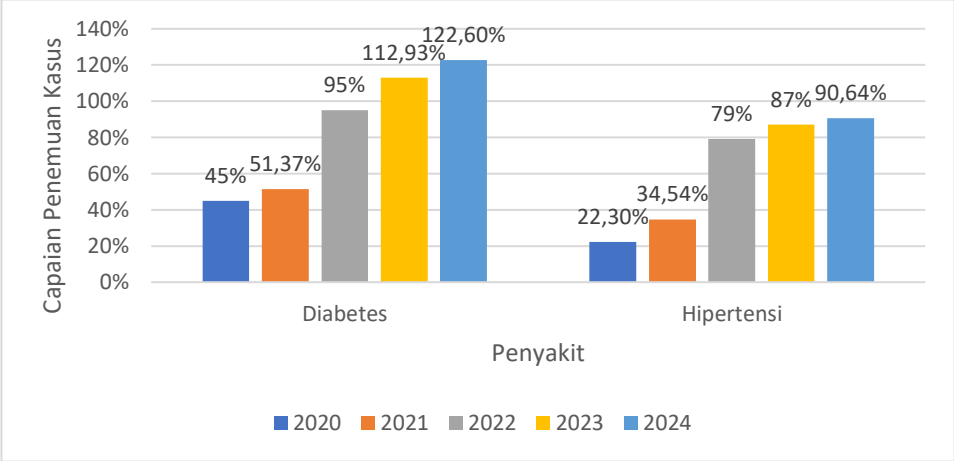


Figure 3. The Chart of Diabetes and Hypertension Case Finding in Tanjung Palas Barat Subdisctrict, 2020-2024

A total of 13 participants with diabetes mellitus underwent random blood glucose (RBG) measurements before and after the intervention, while 24 participants with hypertension had their blood pressure measured before and after the intervention.

Table 1. Mean of Random Blood Glucose (RBG) Levels and Systole of Participants Before and After The Intervention

Measurement	Mean ± SD
Random Blood Glucose (RBG)	
Before intervention	245 ± 44.83
After intervention	202 ± 30.39
Systole	
Before intervention	155.04 ± 18.11
After intervention	132.38 ± 16.29

From the data in Table 1, there were was a decrease of the mean RBG and the mean systole after the intervention. Then the data on RBG levels among Posbindu participants with diabetes mellitus and systolic blood pressure among participants with hypertension were analyzed before the implementation of the *KOPI DI ATI* innovation and one year after the intervention using the Statistical Package for the Social Sciences (SPSS). A paired t-test was applied to assess differences in clinical parameters before and after the intervention.

The results of the paired t-test showed a statistically significant difference ($p < 0.05$). Therefore, it can be concluded that there were significant differences in RBG levels and systolic blood pressure between the pre-intervention and post-intervention periods following the implementation of the *KOPI DI ATI* program.

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CONCLUSION

KOPI DI ATI innovation successfully increased community participation in Posbindu activities and improved public knowledge regarding diabetes mellitus and hypertension. This innovation contributed to increased non-communicable disease (NCD) screening coverage and enhanced new case detection of diabetes mellitus and hypertension. And also there were significant differences in RBG levels and systolic blood pressure between the pre-intervention and post-intervention periods following the implementation of the *KOPI DI ATI* program.

Further cross-sectoral and cross-program collaboration, as well as broader engagement with health partners, is expected to support the continued development and sustainability of this innovation. In addition, the KOPI DI ATI innovation is expected to be adopted and implemented in other regions as an alternative approach to improving the management of diabetes mellitus and hypertension.

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