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Enchancing Community Health Services to Combat Stunting and Non-Communicable Diseases in Ngiliran Village Poncol District, Magetan Regency

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ABSTRACT Stunting and the rising prevalence of non-communicable diseases (NCDs) remain critical public health challenges in rural areas of Indonesia, particularly where access to integrated primary health services is limited. Ngiliran Village, Magetan Regency, faces a dual burden of persistent childhood stunting and increasing cases of diabetes mellitus, hypertension, and obesity, highlighting the need for strengthened community-based health interventions. This community service program aimed to enhance the capacity of Primary Service Integration Posyandu (Integrasi Layanan Primer/ILP) as a strategic platform for stunting prevention and early detection of NCDs through active community participation. A participatory and collaborative approach was employed, involving posyandu cadres, village officials, health workers, and community members. Program activities included balanced nutrition counseling, anthropometric measurements for stunting surveillance, hemoglobin (Hb) testing for anemia screening among adolescents, and random blood glucose (GDS) examinations for early identification of NCD risk. In addition, structured training and mentoring were provided to posyandu cadres to strengthen their competencies in health education, screening, and referral processes. The program demonstrated positive outcomes. The prevalence of stunting declined from 16.6% in 2024 to 12.7% in 2025. Community knowledge regarding balanced nutrition, stunting prevention, and NCDs increased significantly, with 90.5% of participants achieving good post-test scores compared to 50% at baseline. Health screenings identified cases of anemia, pre-diabetes, and diabetes mellitus, enabling timely referral and follow-up. Furthermore, cadre capacity improved substantially, and a cross-sector coordination forum was successfully established to support program sustainability. In conclusion, strengthening ILP-based posyandu services through integrated education, screening, and cadre empowerment effectively improved community health outcomes. This approach demonstrates strong potential for sustainable stunting reduction and NCD prevention at the village level and may serve as a scalable model for similar rural settings.

INDEX TERMS Integrated Primary Services (ILP), Stunting Prevention, Non-Communicable Diseases, Posyandu Empowerment, Community-Based Health Services.

I. INTRODUCTION

Public health challenges in Indonesia remain particularly pronounced in rural areas, where access to integrated and sustainable primary healthcare services is often limited. Two interrelated health problems with long-term consequences continue to dominate rural health profiles, namely childhood stunting and the increasing prevalence of non-communicable diseases (NCDs). Stunting reflects chronic malnutrition during the critical early stages of life and is associated with impaired physical growth, reduced cognitive capacity, and decreased productivity in adulthood, ultimately affecting the quality of human capital [1], [2]. Concurrently, NCDs such as diabetes mellitus, hypertension, and obesity are increasingly detected among rural populations, including those of productive age, indicating a shifting epidemiological transition that demands comprehensive preventive strategies [3], [4].

Ngiliran Village, located in Panekan District, Magetan Regency, exemplifies this dual burden of malnutrition and NCDs. Local health office data indicate that the prevalence of stunting in the village exceeds the national target, while cases of NCDs have shown a rising trend in recent years [5], [6]. These conditions highlight the urgent need for integrated, community-based interventions that not only address nutritional deficiencies in children but also strengthen early detection and prevention of chronic diseases across the life course. Without systematic and collaborative action, these health problems may persist and

exacerbate socioeconomic disparities in rural communities [7].

The state-of-the-art approach in addressing such complex health challenges emphasizes the integration of primary health services through community-based platforms, particularly *Pos Pelayanan Terpadu* (Posyandu), within the framework of Primary Service Integration (*Integrasi Layanan Primer* (ILP)). Recent studies demonstrate that ILP-based Posyandu can effectively enhance health promotion, early detection of disease, and community empowerment when supported by trained cadres and cross-sector collaboration [8], [9]. Posyandu cadres play a strategic role as frontline health agents due to their proximity to the community and their capacity to deliver preventive and promotive services. However, evidence suggests that cadre effectiveness is often constrained by limited knowledge, inadequate training, and insufficient skills related to balanced nutrition counseling, stunting prevention, and NCD screening [10], [11].

Despite growing evidence supporting integrated community health services, a significant research and practice gap remains, particularly in rural settings. Many programs focus either on stunting or NCDs in isolation, with limited emphasis on integrated interventions that simultaneously address both conditions through a life-cycle approach [12], [13]. Furthermore, few community service initiatives comprehensively evaluate the combined impact of nutrition education, health screening, cadre capacity building, and cross-sector coordination within a single intervention framework [14]. This gap underscores the need for practical, evidence-based models that demonstrate how ILP-based Posyandu can function as an effective platform for addressing multiple public health priorities concurrently.

Accordingly, this community service program aims to strengthen community-based health services in Ngiliran Village through the integration of Posyandu primary services to prevent stunting and improve early detection of non-communicable diseases. Specifically, the program seeks to enhance community knowledge and awareness regarding balanced nutrition and healthy lifestyles, conduct health screenings including hemoglobin (Hb) testing for anemia among adolescents and random blood glucose (GDS) examinations for NCD risk detection, and improve the capacity of Posyandu cadres through structured training and mentoring [15]–[17]. In addition, the program aims to establish sustainable cross-sector collaboration involving village authorities, health centers, cadres, and academic institutions. This article offers several key contributions :

1. It presents an integrated ILP-based community service model that simultaneously addresses stunting and NCD prevention in a rural context.
2. It provides empirical evidence on the effectiveness of cadre empowerment and participatory health education in improving community knowledge and early disease detection.
3. It highlights the importance of cross-sectoral collaboration and academic involvement in ensuring program sustainability and scalability at the village level [18]–[20].

The remainder of this article is structured as follows. Section II describes the methods and implementation stages of the community service program. Section III presents the results and key outcomes of the intervention. Section IV discusses the findings in relation to existing literature, followed by Section V, which concludes the article and outlines recommendations for future community-based health initiatives.

II. METHOD AND IMPLEMENTATION

This community service program employed a community-based participatory approach integrated within an applied quasi-experimental framework to strengthen primary health services through *Integrasi Layanan Primer* (ILP) Posyandu. The methodological orientation emphasized collaboration, empowerment, and systematic implementation to address stunting prevention and early detection of non-communicable diseases (NCDs) at the village level. The program was designed to generate practical outcomes while ensuring replicability in similar rural health settings.

A. STUDY DESIGN AND RASIONALE

The study adopted a one-group pretest–posttest design without a control group, which is appropriate for community service based health interventions conducted in natural settings with limited resources and ethical constraints [21]. This design enabled the assessment of changes in community knowledge, cadre capacity, and early disease detection outcomes before and after the intervention. A participatory approach was selected to actively involve Posyandu cadres, adolescents, village officials, and health workers in all stages of the program, thereby enhancing ownership, contextual relevance, and sustainability [22]. The implementation framework consisted of four sequential phases: cross-sector coordination, health screening implementation, capacity building, and follow-up.

B. STUDY SETTING

The program was conducted in Ngiliran Village, Panekan District, Magetan Regency, East Java, Indonesia. The village was selected based on its relatively high prevalence of stunting and the emerging burden of NCDs, as reported by the local health authority. The presence of active Posyandu units, committed village officials, and support from the Panekan Community Health Center (*Puskesmas*) further justified site selection. Program activities were carried out from January to April 2025, encompassing preparatory coordination, implementation of health services, training sessions, and evaluation. All activities were conducted at village halls and Posyandu facilities to ensure accessibility for community members.

C. PARTICIPANTS AND TARGET POPULATION

The primary target population consisted of ILP Posyandu cadres, adolescent cadres, adolescents (male and female),

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and adult community members. Secondary targets included members of the village Family Welfare Movement (PKK) and village administrative staff (*Pamong Desa*). Inclusion criteria were residency in Ngiliran Village, willingness to participate in program activities, and attendance at scheduled sessions. Adolescents aged 12–18 years and adults aged ≥19 years were eligible for health screening activities. Exclusion criteria included individuals with acute illness at the time of screening or those unwilling to provide informed consent. Participants were recruited using purposive sampling to ensure representation of key community health actors [23].

D. INTERVENTION PROCEDURES

The community service intervention was implemented through a structured, multi-stage process designed to strengthen Integrated Primary Services (ILP) Posyandu in stunting prevention and early detection of non-communicable diseases (NCDs). The intervention combined cross-sector collaboration, community-based health screening, capacity building, and follow-up mechanisms to ensure sustainability. The overall workflow of the program is illustrated in FIGURE 1.

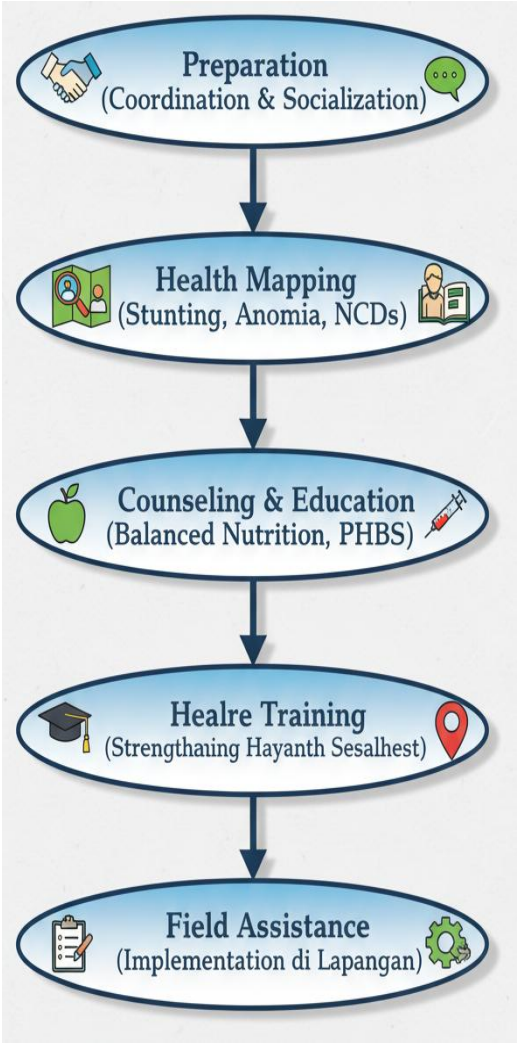

FIGURE 1.Community Health Program Flowchart

1. STAGE 1: CROSS-SECTOR COORDINATION

The intervention began with cross-sector coordination involving village officials, village midwives, ILP Posyandu cadres, and representatives from the Panekan Community Health Center. This stage aimed to align stakeholders' understanding of priority health issues, particularly stunting and non-communicable diseases (NCDs). Meetings were conducted to agree on intervention plans, objectives, activity schedules, and the allocation of roles and responsibilities, including facility and infrastructure support. This coordination resulted in a joint work agreement and the establishment of solid cross-sector collaboration to support effective and sustainable program implementation[24].

2. STAGE 1: CROSS-SECTOR COORDINATION

The second stage focused on the implementation of integrated health screening activities at the ILP Posyandu. Adolescents received balanced nutrition counseling accompanied by hemoglobin (Hb) examinations to detect anemia. Meanwhile, adult participants underwent random blood glucose (GDS), blood pressure, and uric acid checks for early identification of NCD risk factors. All screening activities were conducted using standardized procedures and documented systematically. As a result, up-to-date community health data were obtained, and cases of anemia and NCDs were identified for further follow-up[25]. The screening activities are illustrated in FIGURE 2. Additionally, anthropometric measurements of toddlers were conducted to assess stunting status following national standard procedures, as shown in FIGURE 3**.**

FIGURE 2. Examination of GDs and Hemoglobin

FIGURE 3. Measurement in toddlers for stunting check

3. STAGE 1: CROSS-SECTOR COORDINATION

Capacity building was conducted through structured training sessions for ILP Posyandu cadres and adolescent health cadres. Training was delivered through face-to-face lectures, discussions, and practical exercises covering stunting prevention, balanced nutrition, clean and healthy lifestyle behaviors (PHBS), and NCD prevention. Field practice sessions were included to strengthen cadres' competencies in health education and basic screening services. This stage enhanced the capacity of cadres and adolescents, enabling them to act as agents of health promotion and behavior change within the community[26].

4. STAGE 1: CROSS-SECTOR COORDINATION

The final stage emphasized follow-up actions and sustainability. Participants identified with anemia, pre-diabetes, diabetes mellitus, hypertension, or gout were referred to the Community Health Center for further management. A follow-up action plan (*Rencana Tindak Lanjut/RTL*) was jointly developed to ensure continuity of care. Additionally, a cross-sector cooperation network was formally established to support the long-term sustainability of stunting and NCD prevention activities through ILP Posyandu.

E. MATERIALS AND INSTRUMENTS

Educational media included LCD projectors, laptops, printed booklets, and presentation materials. Health screening instruments consisted of Easy Touch devices for Hb and GDS measurement, alcohol swabs, lancets, test strips, gloves, and safety boxes. Anthropometric tools for stunting assessment included height boards and weight scales calibrated prior to use. All instruments complied with standard operational procedures for community health services.

F. DATA COLLECTION AND ANALYSIS

Data collection involved quantitative and descriptive approaches. Pretest and posttest questionnaires were administered to measure changes in knowledge among cadres and participants. Screening results were tabulated to describe the prevalence of anemia and NCD risk factors. Data were analyzed descriptively using frequency distributions and percentage changes to evaluate program outcomes. This approach aligns with community service evaluation standards focusing on practical impact rather than inferential testing [27].

G. ETHICAL CONSIDERATIONS

Information is not available.

III. RESULT

The result of community service activities carried out in TABLE 2. This table illustrates the significant results achieved in community service activities in Ngiliran Village, both in reducing stunting, increasing community knowledge, and increasing the capacity of health cadres. Overall, this service activity succeeded in achieving positive results in increasing community awareness, knowledge, and skills and strengthening the community-based health system in Ngiliran Village, Panekan District, Magetan Regency [3] The results of this community service activity show several significant achievements.

First, there is a decrease in the prevalence of stunting in Ngiliran Village, which in 2024 will be recorded at 16.6% of a total of 182 children under five, exceeding the national target of 14%. However, by 2025, the prevalence of stunting has managed to drop to 12.7% (23 children), although this achievement has not fully met the target set by the Magetan Regency Health Office, which is a decrease of 10.24% per year. This decline still shows positive progress.

Second, through coaching and counseling activities on balanced nutrition, especially for adolescents and pregnant women, there has been a significant increase in public knowledge about stunting prevention and non-communicable diseases (NCDs). Post-test evaluation showed that 90.5% of participants achieved good category scores, a significant increase compared to only 50% on the pre-test. Third, health checks also provide useful results, especially Hemoglobin (Hb) tests in adolescents. Of the 35 adolescents who actively participated in youth posyandu activities, one adolescent was found to have anemia, which was immediately followed up with referrals to health facilities and the provision of nutrition education. Fourth, the results of the blood sugar screening (GDS) at the ILP Posyandu showed that 78.9% of participants had normal blood sugar levels, while 12.8% were in the pre-diabetes category, and 8.4% were diagnosed with diabetes mellitus. These findings provide the basis for further intervention in the management of NCDs in the community.

Fifth, this program has succeeded in increasing the capacity of posyandu cadres in early detection and health education. As many as 90.5% of posyandu cadres showed a significant improvement in their understanding of NCDs and stunting prevention after participating in the training. Sixth, the formation of a cross-sectoral cooperation network between village officials, health cadres, and local health centers is an important step in supporting the sustainability of this service program. The cross-sectoral forum was formed to plan future activities and ensure the sustainability of the program in overcoming the problem of stunting and NCDs[22].

There has been an increase in public awareness, especially adolescents and pregnant women, on the importance of balanced nutrition and early detection of non-communicable diseases. This is reflected in the enthusiasm of the people who participated in health check-up activities, which exceeded the target that has been set[23].

The results of community service activities in Ngiliran Village show positive progress in reducing the prevalence of stunting, increasing public knowledge, and early detection of non-communicable diseases (NCDs) [24] The decrease in stunting prevalence from 16.6% in 2024 to 12.7% in 2025 shows the success of nutrition and health interventions carried out. Although this achievement has not fully reached the target set by the Magetan Regency Health Office (a decrease of 10.24% per year), this result still illustrates the positive impact of the activities carried

out. According to research conducted by Fitriah et al. (2019), stunting reduction is greatly influenced by community-based interventions involving nutrition education and good parenting, which is reflected in the implementation of this activity [25], [26], [27].

TABLE 1. Urian results of Community Service activities

Activity Results	Description	Related Data
Reducing the Prevalence of Stunting	The prevalence of stunting in Ngiliran Village has decreased from 16.6% (2024) to 12.7% (2025).	Year 2024: 16.6% (30 children) Year 2025: 12.7% (23 children)
Increase of Community Knowledge	Increasing public knowledge about balanced nutrition and the prevention of stunting and NCDs through counseling and coaching.	90.5% of participants achieved a good category post-test score (a significant increase from 50% in the pre-test).
Health Check-Up	Health checks carried out at posyandu, including hemoglobin (Hb) and blood sugar (GDS) checks, for early detection of stunting and NCDs.	a. Adolescents with anemia 1 b. Normal blood sugar: 78.9% c. PRA-DIABETES:12.8% d. diabetes melitus8,4%
Capacity Building of Posyandu Cadres	Coaching and training activities for posyandu cadres improve their ability to carry out early detection and health education related to stunting and NCDs.	Posyandu cadres showed an increase in knowledge: 90.5% and skills in training (pre-test 50%, post-test 90.5%).
Cross-Sector Cooperation Network	The formation of a cross-sector coordination forum involving village officials, health cadres, and health centers to support the sustainability of the program.	A cross-sectoral forum has been established to plan future activities and ensure the sustainability of the program.
Increasing Public Awareness	Increasing public awareness of the importance of stunting and NCD prevention and active participation in health check-up activities.	The enthusiasm of the participants was high, more than the target who attended to take part in the GDS examination and nutrition counseling.

FIGURE 4. 15 Posyandu Cadres and Community Service Team

FIGURE 4 illustrates the involvement of Posyandu cadres and the community service team during the implementation of the Integrated Primary Services (ILP) program in Ngiliran Village. The interaction shown reflects active collaboration between cadres and facilitators in supporting health education, screening activities, and coordination at the community level. This engagement highlights the role of cadres as key actors in delivering integrated stunting prevention and non-communicable disease (NCD) detection services, as well as the importance of teamwork in strengthening sustainable community-based health interventions.

The increase in public knowledge, which can be seen from the increase in post-test scores reaching 90.5%, also reflects the effectiveness of the extension program implemented. This increase matches findings in a study by Yoto (2024) which shows that proper nutrition counseling can increase public understanding of the importance of a balanced diet, especially in vulnerable groups such as adolescents and pregnant women [1] This shows that structured nutrition education can increase public awareness of the importance of preventing stunting and NCDs.

Health checks also gave significant results, with the findings of anemia in one adolescent that were immediately followed up, as well as GDS screening which showed a high rate of early detection of NCDs [7] [28] The results of the GDS examination showing that 12.8% of participants were in the pre-diabetic category (TABLE 1).

IV. DISCUSSION

This study demonstrates that strengthening Integrated Primary Services (Integrasi Layanan Primer/ILP) through Posyandu-based community interventions can effectively address the dual burden of stunting and non-communicable diseases (NCDs) in rural settings. The findings indicate measurable improvements in stunting prevalence reduction, community knowledge enhancement, early detection of anemia and NCD risk factors, and increased capacity of Posyandu cadres. These outcomes highlight the strategic role of integrated, community-driven primary health

services in improving population health across the life course

The observed reduction in stunting prevalence from 16.6% in 2024 to 12.7% in 2025 suggests that integrated nutrition education, routine anthropometric monitoring, and strengthened cadre engagement contributed positively to child growth outcomes. Although the reduction did not fully meet the annual target set by the local health authority, the decline represents meaningful progress within a relatively short intervention period. Stunting is a chronic condition influenced by multifactorial determinants, including maternal nutrition, household food security, sanitation, and caregiving practices; therefore, substantial reductions typically require sustained and multisectoral efforts over time [28].

The significant improvement in community knowledge, as reflected by the increase in post-test scores to 90.5%, underscores the effectiveness of participatory health education delivered through ILP Posyandu platforms. Knowledge improvement among adolescents, pregnant women, and caregivers is particularly important, as these groups play a pivotal role in shaping nutritional practices and health-seeking behaviors within households. Previous research has emphasized that improved health literacy is a critical intermediary outcome that precedes behavioral change and long-term health improvement [29].

Health screening activities revealed the presence of anemia among adolescents and a notable proportion of adults with pre-diabetes and diabetes mellitus. These findings reinforce the importance of integrating NCD screening into routine community health services. Early identification enables timely referral and intervention, potentially preventing disease progression and complications. The detection of NCD risk factors in a rural population also reflects the ongoing epidemiological transition, where lifestyle-related diseases increasingly coexist with undernutrition-related problems [30].

Furthermore, the substantial increase in cadre capacity following structured training and mentoring highlights the value of human resource investment at the community level. Posyandu cadres serve as the backbone of community-based health services in Indonesia. Enhanced competencies in health education, basic screening, and referral processes enable cadres to function not only as service providers but also as health advocates and change agents within their communities [31].

The findings of this study are consistent with prior evidence indicating that integrated primary health service models can effectively improve maternal and child health outcomes. Studies conducted in other low- and middle-income countries have shown that community-based nutrition education combined with regular growth monitoring contributes to gradual reductions in stunting prevalence, particularly when interventions are culturally adapted and locally owned [32].

In line with the present findings, research from Southeast Asia has demonstrated that cadre-led counseling and participatory learning approaches significantly improve community knowledge regarding balanced nutrition and healthy lifestyles [33]. However, unlike many previous interventions that focus solely on child nutrition, this program simultaneously addressed adolescent anemia and adult NCD risk factors, offering a more comprehensive life-cycle approach.

The integration of NCD screening into Posyandu activities aligns with global recommendations advocating for task-shifting and decentralization of NCD prevention services to the community level [34]. Similar programs in rural settings have reported improved detection rates of hypertension and diabetes when basic screening is conducted by trained community health volunteers using standardized protocols [35]. Compared to facility-based screening alone, community-based approaches reduce access barriers and increase participation among populations that might otherwise remain undiagnosed.

Nevertheless, some studies report mixed results regarding the sustainability of community-based interventions once external support is withdrawn [36]. In contrast, the establishment of a cross-sector coordination forum in this program represents a strategic effort to enhance sustainability by institutionalizing collaboration among village authorities, health centers, and academic partners.

The study has several limitations that should be acknowledged. First, the use of a one-group pretest–posttest design without a control group limits the ability to attribute observed changes solely to the intervention. External factors, such as concurrent government programs or broader socioeconomic changes, may have influenced the results. Second, the relatively short implementation period restricts the assessment of long-term impact, particularly for outcomes such as sustained stunting reduction and NCD incidence. Stunting, in particular, requires long-term monitoring to determine whether improvements in nutritional status are maintained over time. Third, data analysis relied primarily on descriptive statistics, which limits inferential conclusions regarding the magnitude and statistical significance of changes. However, this approach is common in community service evaluations that prioritize practical impact and feasibility over experimental rigor [37]. Finally, the absence of detailed qualitative data limits deeper understanding of participant perceptions, behavioral changes, and contextual factors influencing program effectiveness. Future studies incorporating mixed-methods designs may provide richer insights into mechanisms of change and community experiences.

Despite these limitations, the findings offer several important implications for community health practice and policy. First, ILP-based Posyandu can serve as an effective platform for integrated health promotion, bridging traditionally fragmented services for nutrition and NCD prevention. Policymakers should consider strengthening Posyandu functions beyond maternal and child health to encompass a broader spectrum of preventive services across age groups.

Second, investment in cadre capacity building is essential for ensuring service quality and sustainability. Continuous training, supervision, and incentives are

necessary to maintain cadre motivation and performance. Integrating digital tools for reporting and monitoring may further enhance efficiency and data quality in community health services [38]. Third, cross-sector collaboration emerged as a key enabler of program success. Formalized partnerships between village governments, health centers, and academic institutions can facilitate resource mobilization, technical support, and evidence-based planning. Such collaboration aligns with national health system strengthening agendas that emphasize decentralization and community empowerment [39]. Finally, the integrated approach demonstrated in this study may serve as a scalable model for other rural areas facing similar dual burdens of malnutrition and NCDs. Adaptation to local contexts, sustained political commitment, and continuous evaluation will be critical for successful replication.

V. CONCLUSION

This community service initiative was fundamentally designed to reinforce community-based health frameworks in Ngiliran Village, Panekan District, Magetan Regency, by operationalizing the Primary Service Integration Posyandu (ILP) model to mitigate stunting and non-communicable diseases (NCDs). The program successfully realized its core objectives, evidenced by a significant reduction in stunting prevalence from 16.6% in 2024 (affecting 30 children) to 12.7% in 2025 (affecting 23 children). Furthermore, health literacy regarding balanced nutrition and disease prevention underwent a substantial elevation, with 90.5% of participants achieving high-category post-test scores, marking a notable progression from the 50% baseline recorded during pre-intervention assessments. Clinical screenings provided critical epidemiological data, identifying a 12.8% prevalence of pre-diabetes and an 8.4% prevalence of diabetes mellitus among the adult population, while early detection efforts amongst 35 adolescents successfully identified one case of anemia for immediate clinical referral. Capacity-building efforts significantly empowered local human resources, with 90.5% of Posyandu cadres demonstrating enhanced technical proficiency in conducting health education and primary screenings. The establishment of a formalized cross-sectoral coordination forum involving village officials, health centers, and academic facilitators further ensures the institutional sustainability of these health interventions. Despite these achievements, the study recognizes limitations concerning the intervention duration and localized sample size. Consequently, future works should prioritize the integration of digital health technologies for longitudinal monitoring, the expansion of program replication across broader geographical areas, and the implementation of more rigorous quantitative research designs to validate the long-term behavioral and clinical impacts of the ILP framework on rural public health.

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DATA AVAILABILITY

No datasets were generated or analyzed during the current study.

AUTHOR CONTRIBUTION

The author contributions for this study are distributed across several key domains to ensure the successful implementation of the community-based health program. Nurwening Tyas Wisnu was responsible for the conceptualization of the service framework and supervised the clinical hemoglobin screenings for adolescents. Triana Septianti designed the nutritional counseling interventions and managed the longitudinal stunting prevalence data. Sulikah focused on the pedagogical aspects of the program, specifically developing the training modules for Posyandu cadres and analyzing the pre-test and post-test literacy scores. Hery Sumasto, serving as the corresponding author, facilitated the essential cross-sectoral coordination between the university and local government agencies, while also providing critical revisions to the manuscript. Finally, Mulyananda Dwi Mentari conducted the field-based screening for non-communicable diseases and oversaw the compilation of technical data and figures.

DECLARATIONS

ETHICAL APPROVAL

Information is not available.

CONSENT FOR PUBLICATION PARTICIPANTS.

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests

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