

IMPROVING THE KNOWLEDGE AND SKILLS OF POSYANDU CADRES REGARDING DIABETES MELLITUS: AN EFFORTS TO STRENGTHEN PRIMARY SERVICE INTEGRATION AT THE TAHTUL YAMAN COMMUNITY HEALTH CENTRE, JAMBI CITY

Nyimas Natasha Ayu Shafira¹, Rina Nofri Enis², Citra Maharani³, Amelia Dwi Fitri¹, Tengku Arief Buana Perkasa³, Afifah Amatullah⁴, Debby Hasmita⁵

¹Departement of Medical Education, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia.

²Departement of Anatomy, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia.

³Departement of Medical Biology and Biochemistry, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia.

⁴Departement of Internal Medicine, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia.

⁵Tahtul Yaman Community health Centre, Jambi, Indonesia.

Corresponding author email: nyimas_natasha@unja.ac.id

ABSTRACT

Diabetes mellitus (DM) is a significant public health challenge, with a rapidly increasing burden in Indonesia. Community health cadres (kader) are crucial for community-level prevention, yet many possess limited knowledge regarding DM management and prevention. This community engagement program aimed to enhance the knowledge, attitudes, and practices (KAP) of health cadres within the Tahtul Yaman Primary Health Center area in Jambi City, focusing on diabetes prevention and control. This program utilized a participatory action research approach involving 15 active community health cadres. The intervention, conducted between August and September 2025, consisted of structured training modules, interactive lectures, Focus Group Discussions (FGDs), skill-based simulations (including glucometer use), and the distribution of educational toolkits. A pre-test/post-test design was used to evaluate changes in knowledge, with data analyzed using the Wilcoxon signed-rank test. Qualitative data were gathered through reflection sessions and one-month post-training field observations. Participants showed a statistically significant improvement in knowledge regarding diabetes prevention and management. The median knowledge score increased from 60 (IQR 40–80) at pre-test to 80 (IQR 40–90) at post-test ($p = 0.009$). Qualitative findings revealed positive shifts in cadres' attitudes and increased self-efficacy in communicating health information. Key themes identified included knowledge empowerment and enhanced readiness for community engagement. Follow-up observations confirmed that cadres successfully applied their new skills, such as conducting risk screenings and health education, during community Posyandu ILP sessions. A structured, participatory, and context-sensitive training program effectively enhanced the knowledge, attitudes, and practical skills of community health cadres in DM prevention. Empowering cadres through continuous mentorship and integrating such programs into local health systems offers a sustainable and scalable strategy to strengthen community resilience and advance chronic disease management.

Keywords: *Diabetes melitus, community health cadres, health education empowerment, non-communicable diseases primary health care.*

ABSTRAK

Diabetes mellitus (DM) merupakan tantangan kesehatan masyarakat yang signifikan, dengan beban yang meningkat pesat di Indonesia. Kader kesehatan masyarakat (kader) memegang peran penting dalam pencegahan di tingkat masyarakat, namun banyak yang memiliki keterbatasan pengetahuan mengenai manajemen dan pencegahan DM. Program keterlibatan masyarakat ini bertujuan meningkatkan pengetahuan, sikap, dan praktik (KAP) kader kesehatan di wilayah Puskesmas Tahtul Yaman, Kota Jambi, dengan fokus pada pencegahan dan pengendalian diabetes. Program ini menggunakan pendekatan penelitian tindakan partisipatif yang melibatkan 15 kader aktif. Intervensi, yang dilaksanakan antara Agustus dan September 2025, meliputi modul pelatihan terstruktur, ceramah interaktif, Diskusi Kelompok Terfokus (FGD), simulasi berbasis keterampilan (termasuk penggunaan glukometer), serta pendistribusian paket alat edukasi. Desain pre-test/post-test digunakan untuk mengevaluasi perubahan pengetahuan, dengan analisis data menggunakan uji Wilcoxon tanda berpasangan. Data kualitatif dikumpulkan melalui sesi refleksi dan observasi lapangan satu bulan pasca-pelatihan. Peserta menunjukkan peningkatan pengetahuan yang signifikan secara statistik; skor median pengetahuan meningkat dari 60 (IQR 40–80) pada pre-test menjadi 80 (IQR 40–90) pada post-test ($p = 0.009$). Temuan kualitatif mengungkapkan perubahan sikap yang positif dan peningkatan efikasi diri kader dalam menyampaikan informasi kesehatan. Tema kunci yang muncul meliputi pemberdayaan pengetahuan dan kesiapan yang meningkat untuk keterlibatan masyarakat. Observasi tindak lanjut mengonfirmasi bahwa kader berhasil menerapkan keterampilan baru, seperti melakukan skrining risiko dan penyuluhan kesehatan, selama sesi Posyandu ILP di masyarakat. Program pelatihan yang terstruktur, partisipatif, dan sensitif terhadap konteks secara efektif meningkatkan pengetahuan, sikap, dan keterampilan praktis kader kesehatan masyarakat dalam pencegahan DM. Memberdayakan kader melalui pendampingan berkelanjutan dan mengintegrasikan program semacam ini ke dalam sistem kesehatan lokal menawarkan strategi yang berkelanjutan dan dapat diskalakan untuk memperkuat ketahanan komunitas dan memajukan pengelolaan penyakit kronis.



Kata kunci: Diabetes melitus, kader kesehatan masyarakat, pemberdayaan pendidikan kesehatan, pelayanan kesehatan primer untuk penyakit tidak menular

INTRODUCTION

Diabetes mellitus (DM) has emerged as one of the most pressing global public health challenges, with its prevalence rising sharply over recent decades. According to the International Diabetes Federation (IDF), by 2025, approximately one in nine adults will be living with diabetes, and this number is expected to increase to one in eight by 2050. Alarmingly, more than 90% of these cases will be type 2 diabetes. [1] The burden of diabetes is growing particularly fast in low- and middle-income countries, including Indonesia, which now ranks among the nations with the highest number of DM cases worldwide. [2]

In Indonesia, data from the Basic Health Research Survey showed that 2.0% of individuals aged 15 years and above had been diagnosed with DM by a physician. However, when including undiagnosed cases, the total prevalence reached 8.5%. [3] The Indonesia Health Survey (SKI, 2023) revealed an even more concerning trend, reporting a national prevalence of 11.7%, equivalent to roughly 19.5 million people living with diabetes. [2] Many individuals remain unaware of their condition, leading to delays in treatment and an increased risk of serious complications. In Jambi Province, the prevalence of DM was reported at 6.05%. [4] Meanwhile, in Jambi City, 10,317 cases were documented representing about 1.6% of the total population. [5]

The Tahtul Yaman Primary Health Center, as one of the city's first-level health care providers, continues to face a significant burden from diabetes. Screening data from 2023 indicated that 8.6% of 1,650 individuals had hyperglycemia, while 10.4% were in the prediabetic range. Major risk factors such as hypertension (41.0%), general obesity (25.6%), and central obesity (41.4%) were also alarmingly prevalent. [6] Although national initiatives like Prolanis and the Integrated Primary Service Posyandu (ILP) have been established to improve non-communicable disease control, gaps remain in the knowledge, attitudes, and practices of community health cadres regarding diabetes management. Several studies have shown that many cadres still possess limited understanding of type 2 DM particularly in areas related to complication prevention, personalized patient education, and the use of digital health tools. [7,8]

Empowering these cadres through targeted, behavior-oriented, and context-sensitive training is therefore essential. As trusted members of their communities, health cadres serve as vital links between formal health services and the public. Strengthening their capacity can significantly enhance community awareness, early detection, and preventive action against diabetes. [9-11] This community engagement program was designed to build the capacity of health cadres working within the Tahtul Yaman Primary Health Center area. By equipping them with updated knowledge, practical skills, and communication strategies, the program aims to enable cadres to take a more active and effective role in diabetes prevention and control through the Posyandu ILP platform.

METHODS

Study Design and Setting

This community engagement initiative was designed as a structured training and empowerment program for community health cadres (kader kesehatan), aimed at strengthening their knowledge, attitudes, and practices (KAP) in the prevention and management of Diabetes Mellitus (DM). The program adopted a participatory action research approach, emphasizing collaboration and mutual learning between Universitas Jambi and the Tahtul Yaman Primary Health Center in Jambi City, Indonesia. Activities were implemented between August and September 2025. The Tahtul Yaman area was selected as the intervention site due to its high prevalence of diabetes and prediabetes, as well as the significant burden of associated risk factors such as obesity, hypertension, and low public awareness. The program took place in the Tahtul Yaman Health Center training hall and was carried out under continuous coordination with the Jambi City Health Office.

Program Preparation and Coordination

The preparatory phase focused on building consensus and ensuring readiness. Coordination meetings were held with the head and staff of the Tahtul Yaman Primary Health Center to align program objectives, finalize the training schedule, define participant criteria, and secure logistical and technical support. Facilities including audiovisual tools (LCD projector, laptop) and medical equipment (glucometers, sphygmomanometers) were prepared prior to implementation.

Identification and Recruitment of Cadres

Health cadres actively involved in Posyandu ILP and Prolanis programs were identified and invited to participate. Twenty cadres aged 25–55 years, each with at least one year of service experience, were selected based on their availability and commitment to complete all sessions and evaluations.

Development of Training Modules and Materials



Training modules were developed following national guidelines and the World Health Organization (WHO) recommendations on diabetes prevention and management. The content included: (a) Basic concepts of type 2 diabetes (epidemiology, pathophysiology, risk factors); (b) Early detection and classification of DM and prediabetes; (c) Primary and secondary prevention strategies; (d) Lifestyle modification (diet, physical activity, medication adherence); (e) Recognition and management of complications; (f) Patient education and culturally sensitive communication; (g) Use of simple monitoring tools such as glucometers and; (h) A pre-training questionnaire was also prepared to measure baseline cadre knowledge before the intervention..

Training Implementation

Training was conducted through interactive and skill-based sessions, combining theoretical and practical learning. The main components included: (a) Pre-test assessment to measure initial knowledge and skills; (b) Interactive lectures delivered by internal medicine specialists and public health educators (c) Focus Group Discussions (FGDs) and brainstorming sessions for sharing field experiences; (d) Simulation and role-play activities to practice health communication, education delivery, and blood glucose screening; (e) Post-test evaluation to assess improvement in knowledge and skills and; (f) Reflection sessions, where cadres discussed their experiences, confidence, and readiness to apply new skills in the community.

Post-Training Field Practice and Mentoring

Following the training, cadres carried out supervised community activities, such as health education and limited diabetes screening during Posyandu ILP sessions. One month after completion, follow-up visits were conducted to observe cadre performance, identify challenges, and provide supportive mentoring.

Distribution of Educational Media and Tools

To sustain learning and facilitate ongoing community engagement, each cadre received a toolkit consisting of: (a) A DM educational pocketbook; (b) Health education leaflets and posters; (c) Simple risk-screening forms and; (d) Anthropometric measurement tools (waist tape and manual BMI chart).

Collaboration and Sustainability Strategy

All program activities and outcomes were documented and reported to the Tahtul Yaman Primary Health Center as evidence to support the strengthening of the Posyandu ILP program. Trained cadres were encouraged to mentor untrained peers, creating a cascade model for capacity building. Refresher training sessions every 6–12 months were proposed to maintain knowledge retention and promote sustainable impact.

Data Collection and Evaluation

Pre-test and post-test scores were analyzed using the Wilcoxon signed-rank test to determine improvements in cadres' knowledge and attitudes following training. One month after the intervention, cadre activities during Posyandu ILP sessions were observed to assess practical skill application, community interaction, and areas requiring further support.

RESULTS AND DISCUSSION

Participant Characteristics

A total of 15 community health cadres took part in the training and empowerment program. All participants were women aged between 25 and 55 years (mean age: 39.4 ± 8.1 years). The majority had completed senior high school education (70%) and had more than two years of experience in community-based programs such as Posyandu ILP and Prolanis under the supervision of the Tahtul Yaman Primary Health Center. Every participant successfully completed the full training program as well as the post-training follow-up evaluation.

Quantitative Outcomes

The pre- and post-training assessments showed a significant increase in cadres' knowledge scores related to diabetes management. The median score improved from 60 (IQR 40–80) before training to 80 (IQR 40–90) afterward ($p = 0.009$, Wilcoxon signed-rank test). Substantial progress was also observed in cadres' understanding of risk factor identification, blood glucose monitoring, and patient counseling. Practical skills especially the use of glucometers and anthropometric tools showed noticeable gains in both accuracy and confidence during the simulation sessions.

Table 1. Pre- and Post-training assessments score

Assessments	Score (n=15,%)	P Value
Pre-test	60 (40-80)	0.009*
Post-test	80 (40-90)	

The data was not normally distributed, so it was presented in median (range) and the Wilcoxon test was used. The significance level used was $p < 0.05$.



Post-test surveys and reflection discussions revealed a positive shift in cadres' attitudes toward proactive diabetes prevention and health education. Many participants expressed stronger motivation to conduct regular community-based screenings and to serve as role models in promoting healthy lifestyles. They also reported greater confidence in communicating with community members and delivering health information in culturally relevant ways.

Qualitative Findings

Analysis of focus group discussions and post-training reflections revealed three major themes: Knowledge empowerment through experiential learning, Increased confidence in public communication, Enhanced readiness for community engagement. Cadres consistently emphasized that the interactive simulations, role-play exercises, and peer discussions were the most impactful parts of the program. These activities allowed them to better internalize complex health concepts and translate them into messages that resonate with their communities.

One month after training, cadres applied their newly acquired skills during Posyandu ILP sessions. They successfully performed basic diabetes risk screenings and health education activities using the distributed media kits. Observations showed that over 80% of cadres conducted screenings and documentation tasks correctly. Community members responded positively, appreciating the clear and relatable explanations provided by the cadres. These outcomes illustrate the sustainability potential of the program—cadres were not only functioning as volunteers but also emerging as peer educators and local health advocates in their neighborhoods.

Discussion

This study demonstrated that a structured and community-based training program significantly enhanced the knowledge, attitudes, and practices of community health cadres in the prevention and management of Diabetes Mellitus (DM). The improvement was statistically significant, with the median knowledge score increasing from 60 to 80 after the intervention ($p = 0.009$). This finding confirms that well-designed educational interventions can effectively strengthen the competencies of health cadres, equipping them to play a more proactive role in diabetes control at the community level. Similar outcomes have been reported in previous studies, which found that targeted health education improves both cognitive understanding and behavioral skills among cadres and community health workers.[12-13]

Several factors contributed to this success. Externally, the structured and participatory design of the training played a crucial role. The combination of interactive lectures, focus group discussions, and skill-based simulations ensured that cadres were not merely passive listeners but active learners. The materials were developed in alignment with national guidelines and WHO recommendations, ensuring both accuracy and relevance. These methods also reflect adult learning (andragogical) principles, which emphasize participation, real-world application, and experiential learning.[14] Furthermore, the supportive communication style of facilitators fostered an encouraging atmosphere, echoing findings by Purnomo (2021), who highlighted that empathy and interactive teaching styles enhance motivation and comprehension among trainees.[15]

Internal factors also played a part. Motivation, educational background, and prior experience influenced how cadres absorbed and applied new information. Cadres who were more motivated or had prior experience in health promotion tended to engage more actively and retain information better. Although older cadres sometimes processed new material more slowly, their practical field experience helped them contextualize and reinforce learning. This is consistent with the view of Wawan and Dewi (2010), who noted that motivation and experiential context are key determinants of learning outcomes. [16]

The findings also reaffirm the pivotal role of health cadres in community-based disease prevention. As trusted figures within their neighborhoods, cadres possess both cultural understanding and social proximity qualities that make them effective agents for promoting health behavior change. Yanti et al. (2021) emphasized that this trust-based relationship strengthens cadres' influence in encouraging healthy practices within local communities. [17]

Globally, similar empowerment models for community health workers (CHWs) have shown promising results, especially in low- and middle-income countries (LMICs). Alaofè et al. (2017) and the Community Preventive Services Task Force (2021) both reported that CHW-led interventions improved diabetes-related knowledge, self-care behavior, and glycemic outcomes. [18-19] The current findings align with this evidence, demonstrating that cadre empowerment programs can generate sustainable community-level health benefits.

This program's emphasis on community linkage and system integration further strengthened its impact. By positioning cadres as bridges between the Puskesmas (primary health centers) and the community, the program promoted bidirectional communication and better service accessibility. This approach resonates with Babagoli et al. (2020), who argued that CHWs' awareness of local culture and social context enhances the relevance and effectiveness of health interventions. [20] In this study, trained cadres also began serving as peer educators within the Posyandu ILP network, extending the reach of diabetes prevention activities through a sustainable, cascading model.

Another key strength was the incorporation of experiential and mentored learning. Through role-playing, simulation, and supervised fieldwork, cadres translated theoretical knowledge into practical, real-world skills.

This aligns with previous research showing that experiential training promotes long-term behavioral change and sustained community health impact. [21-22] Reflection sessions and post-training mentoring further enhanced cadre confidence, communication ability, and commitment to ongoing community engagement.

Ensuring program sustainability is vital. The inclusion of mentorship, educational toolkits, and refresher training plans supports the continuity of knowledge and practice. This mirrors the CDC's Emerging Practices in CHW Programs (2020), which highlights ongoing supervision and structured support as critical elements for successful CHW programs. [23] Institutionalizing these practices through local health policies, regular monitoring, and integration into health information systems could ensure long-term effectiveness and scalability.

Nevertheless, challenges remain. Structural and social determinants such as limited education, transportation barriers, and socioeconomic disparities continue to affect participation and retention. These findings are consistent with global literature emphasizing that community-based programs must address issues of equity and access to reach high-risk or undiagnosed populations. [24-25]

From a policy perspective, this study underscores the importance of embedding cadre empowerment within Indonesia's national framework for non-communicable disease (NCD) control. Regular refresher courses, structured peer mentoring, and formal recognition mechanisms can sustain cadre motivation and performance. Moreover, integrating monitoring data from community-based programs into national health surveillance systems would support evidence-based decision-making and equitable resource allocation. [26-29]

CONCLUSION

This program effectively enhanced the knowledge, attitudes, and practices of health cadres in Diabetes Mellitus prevention and control. The structured, participatory, and human-centered training approach not only improved individual competencies but also strengthened collaboration with primary health services. These results highlight that sustainable community health improvement relies on empowerment, continuous mentorship, and contextual learning. Integrating cadre training within local and national health systems offers a practical and scalable strategy to advance diabetes prevention and foster community resilience toward chronic disease management.

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