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Community-Based Education on the Use of Medicinal Plants for Diabetes Mellitus Management among Elderly Participants at Posyandu Lansia Sadewo, Jati Village, Sidoarjo

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ABSTRACT Diabetes mellitus is a chronic disease that requires lifelong management and often encourages patients to explore complementary therapies. Herbal remedies are frequently used alongside medical treatment, though in some cases patients reduce or discontinue prescribed medications. Limited knowledge of proper self-care and the integration of herbal therapies contributes to poor adherence and increases the risk of complications. This community service program aimed to enhance knowledge among health cadres and community members regarding the use of family medicinal plants (*TOGA*) as complementary therapy to support blood glucose control. The activity was conducted in RT 26 RW 06, Pondok Jati, Jati Village, Sidoarjo, focusing on communities affected by non-communicable diseases, particularly diabetes. Interventions included structured educational sessions, distribution of an educational module, and live demonstrations of herbal preparation. Effectiveness was evaluated through pre- and post-test questionnaires, assessment of program implementation, and follow-up planning. Results showed a 65% increase in participants' knowledge of TOGA utilization for diabetes management. The coaching approach, which emphasized empowerment, emotional support, and healthy dietary practices, further demonstrated its value as a strategy for community-based diabetes prevention and management. In conclusion, integrating herbal education into community programs can substantially improve knowledge and promote complementary practices, while coaching-based interventions strengthen empowerment and encourage sustainable behavioral change.

INDEX TERMS Community-based education; diabetes management; medicinal plants; complementary therapy.

I. INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder necessitating lifelong management, prompting patients to seek interventions perceived as effective in alleviating disease-related symptoms. Treatment adherence among DM patients is often challenged by fatigue and perceived therapeutic failure, leading some individuals to discontinue conventional pharmacotherapy in favor of alternative approaches [1]. Globally, there is an increasing trend of utilizing complementary and alternative medicine (CAM) to enhance health outcomes in DM, reflecting patient-driven efforts to optimize self-care and disease control [2,3]. Herbal medicine represents one of the most commonly adopted CAM modalities, underpinned by the perception that natural compounds are inherently safer and better tolerated than synthetic medications. This is particularly relevant for DM patients who experience adverse effects from oral antidiabetic agents, including nausea, vomiting, and bloating [4].

Globally, the prevalence of complementary and alternative medicine (CAM) use among patients with diabetes is estimated to reach around 51%, reflecting the widespread adoption of non-conventional approaches as adjuncts to standard medical treatment (Alzahrani et al., 2024). In Indonesia, a recent study reported that 54.3% of individuals with type 2 diabetes use CAM, and notably, 69.5% of them do not disclose such use to healthcare professionals (Sari et al., 2021). Meanwhile, the prevalence of diabetes mellitus in East Java has continued to increase, from 2.1% to 2.6% between 2018 and 2022, highlighting a rising public-health burden that necessitates sustainable community-based interventions (Ministry of Health RI, 2022). These findings emphasize the importance of educational initiatives to ensure the safe integration of traditional herbal use with conventional diabetes management, particularly among older adults and community health cadres in the region.

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Empirical evidence from Joeliantina et al. (2018), involving 125 respondents in Surabaya, indicates a pronounced tendency among DM patients to incorporate herbal remedies as adjuncts to conventional therapy. Factors influencing this behavior include prevailing trends in herbal usage, strong personal motivation to experiment with herbal products, and exposure to information perceived as credible regarding their therapeutic efficacy. Commonly employed herbal interventions among DM patients include extracts of noni, sambiloto, bay leaves, bungur leaves, imba leaves, breadfruit leaves, roselle flowers, mangosteen rind, propolis, bitter herbal formulations, cinnamon, and bitter melon. Patients often perceive these remedies as beneficial in regulating glycemic levels when used alongside prescribed pharmacotherapy [5,6]. Survey data further reveal that herbal medicine is predominantly utilized as a complementary treatment; however, a subset of patients relies solely on herbal remedies, particularly when they report stable blood glucose levels and overall well-being.

The prevailing pattern of complementary herbal use involves modification of conventional medication regimens. Adjustments typically consist of dose reduction or temporary discontinuation while concurrently administering herbal remedies. Specifically, patients prescribed a single conventional agent may alternate it with herbal interventions, whereas patients on dual-drug regimens may continue only one agent in combination with herbal therapy. Although this practice is believed to reduce side effects and enhance perceived efficacy, it also creates potential risks for drug–herb interactions and suboptimal glycemic control.

A critical concern is the frequent lack of disclosure regarding herbal use to healthcare providers, which constitutes a high-risk behavior with potential for adverse interactions and disease-related complications [7,8]. Patients may refrain from reporting herbal consumption due to assumptions that natural remedies are harmless or because of limited trust in professional acceptance of CAM practices. This concealment not only compromises the physician's ability to optimize therapeutic regimens but also increases the likelihood of uncontrolled disease progression. Consequently, structured patient education is essential to ensure adherence to conventional pharmacotherapy while safely integrating complementary therapies [1].

Community-based health initiatives provide an effective platform for delivering evidence-based guidance, enhancing health literacy, and promoting self-management behaviors among DM patients utilizing herbal remedies. In Indonesia, family medicinal plants, locally referred to as TOGA (Tanaman Obat Keluarga), are widely cultivated and represent a culturally accepted source of complementary treatment. Leveraging TOGA within structured educational programs allows communities to recognize both the potential benefits and the limitations of herbal medicine. This approach not only strengthens disease prevention efforts but also supports the broader goal of empowering patients to take an active role in managing their health.

This community engagement program aims to enhance the knowledge and self-care skills of older adults with diabetes mellitus regarding the use of family medicinal plants as complementary therapy. Through educational interventions, participants are expected to understand the safe and effective integration of herbal remedies alongside conventional treatments. The program also seeks to empower local health cadres to promote the sustainable use of traditional herbal resources within their communities. Ultimately, this initiative intends to improve diabetes management outcomes and support healthier lifestyles among the elderly population.

Health cadres play a central role in disseminating this knowledge, as they serve as trusted sources of health information at the community level. Enhancing the capacity of health cadres in DM management particularly in the integration of TOGA ensures that patients receive consistent and reliable messages about safe herbal use. In accordance with the Nursing Act No. 38 of 2014, nurses and community health cadres are authorized to deliver complementary and alternative nursing care. However, limited understanding of evidence-based herbal practices among both providers and patients underscores the urgent need for structured educational interventions to ensure safe and effective use of traditional medicinal plants in diabetes management [9]. Strengthening cadre and nurse involvement in community-based DM management is thus pivotal in bridging the gap between conventional healthcare services and patient-driven CAM practices.

II. METHODOLOGY

A. METHOD

The target of activities in this Community Partnership Program is the implementation of community service aimed at increasing the knowledge of elderly individuals with diabetes mellitus regarding the utilization of TOGA for diabetes management. The partnership participates in mobilizing the community to attend and actively engage in this community service activity. In addition, the partnership also contributes by providing the venue and supporting facilities to ensure the smooth execution of the community service.

The community service activities were conducted in two sessions on August 22–29, 2025, at RT 26 RW 06, Pondok Jati, Jati Village, Sidoarjo, starting at 08:30 AM WIB. The target participants are the community, particularly individuals with non-communicable diseases (NCDs), especially patients with diabetes mellitus. The community service activities were carried out by providing health services, health education, and the planting of TOGA. Education was delivered through lectures combined with a question-and-answer discussion and demonstrations on the preparation of herbal remedies from TOGA.The media used in this community service activity included PowerPoint presentations, the distribution of educational modules on "Utilization of Family Medicinal Plants for Individuals with Diabetes Mellitus," and demonstration equipment. Evaluation of the community service implementation was

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conducted through questionnaires, which included assessment of the effectiveness of health education (pre-test and post-test), evaluation of the activity execution, and planning of follow-up actions. The effectiveness of the health education activities was evaluated by measuring changes in participants' knowledge through questionnaires. The evaluation of activity implementation assessed the comfort and safety of the process using questionnaires, which covered aspects such as the timing of the activities, the delivery of the material, and the services provided (including meals, facilities, and accessibility of the activity location).

The mandatory outputs of community service under the PKM scheme are as follows: articles in print or electronic mass media, activity videos, and the enhancement of the partners' empowerment in accordance with the problems they face. Additional outputs from this community service activity include intellectual property rights in the form of copyrights related to the community service activities.

Data were analyzed using a one-group pre–post design to evaluate changes in participants' knowledge before and after the educational intervention. Normality of the difference scores was assessed using the Shapiro–Wilk test. If the data were normally distributed, a paired t-test (two-tailed) was applied; otherwise, the Wilcoxon signed-rank test was used. The level of significance was set at $\alpha = 0.05$ with a 95% confidence interval. Effect size was reported as Cohen's d (dz) for the paired t-test or $r = Z/\sqrt{N}$ for the Wilcoxon test, interpreted as small (0.1–0.2), medium (0.3–0.5), or large (>0.5). Statistical analyses were performed using R or SPSS software.

B. IMPLEMENTATION

The community service activities carried out included several components: health services, pre-test and post-test assessments, distribution of modules on the utilization of herbal plants, health education delivered through lectures, discussions, and question-and-answer sessions, demonstrations on herbal preparation, and the planting of TOGA, particularly those with potential to help control blood glucose levels in diabetes mellitus (DM) patients, such as bay leaves, bitter melon, ginger, and others.

The health services provided included measurements of blood glucose and uric acid levels, height and weight, waist circumference, and blood pressure. The results of these assessments were shared with participants, and they were instructed on how to interpret the values. The aim was to raise awareness among patients regarding potential disease risks and complications.

Health education focused on the use of TOGA as a complement to a healthy lifestyle for individuals with DM, emphasizing self-care practices including diet regulation, physical activity, blood glucose monitoring, and medication adherence.

The community education program was conducted over two consecutive sessions within a two-week period. Each session lasted approximately two to three hours and followed a structured sequence consisting of an opening session, pre-test, health education, demonstration, discussion, and post-test evaluation. The facilitators comprised a team of three nursing lecturers specializing in medical-surgical and community nursing and five nursing students who assisted in participant engagement, data collection, and demonstrations. The curriculum included four main components an overview of diabetes mellitus and lifestyle modification for glycemic control, the concept of Family Medicinal Plants (TOGA) as complementary therapy, safe preparation and processing techniques for herbal materials commonly used in diabetes management, and practical guidance for integrating herbal use with medical treatment under health supervision. Educational media consisted of PowerPoint presentations, printed learning modules, posters, and demonstration kits. Learning activities included lectures, interactive discussions, demonstrations of herbal preparation, question–answer sessions, and group reflections to reinforce understanding and behavioral change.

The implementation of community service is illustrated in the figure below.

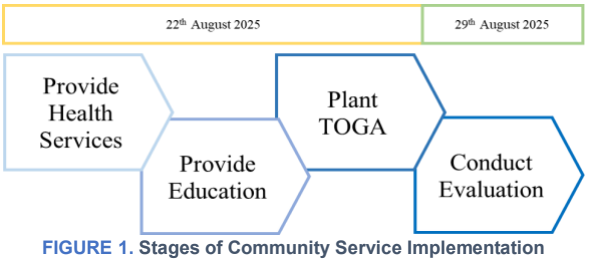

FIGURE 1. Stages of Community Service Implementation

On the first day, the program commenced with an opening ceremony attended by representatives from the local health center (Puskesmas), responsible for the elderly posyandu (health post) Sadewo, followed by health screenings including weight, height, blood pressure, blood glucose, cholesterol, and uric acid measurements, as well as the administration of a pre-test and educational sessions. The pre-test served as a baseline assessment conducted prior to any intervention, training, or program, providing a reference for subsequent evaluation.

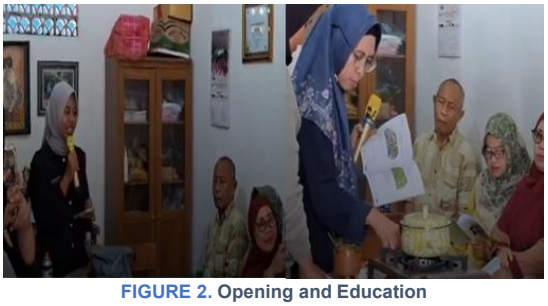

FIGURE 2. Opening and Education

The community service activities were officially inaugurated by the Head of Puskesmas, who expressed appreciation for the team's initiative in empowering the use of TOGA for DM patients. The Head emphasized the importance of medication adherence to prevent complications and improve quality of life, encouraged participants to use traditional remedies as complementary therapy, and introduced the Puskesmas' traditional medicine service, Poli

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Batra, urging participants to actively engage in the program and apply the knowledge gained in daily life.

FIGURE 3. Pre-Test Implementation

The pre-test consisted of a questionnaire assessing participants' baseline knowledge and skills regarding DM, medical treatment adherence, and traditional medicine practices. This allowed the team to identify participants' initial understanding.

FIGURE 4. Post-Test Implementation

The second session was held on August 29, 2025, attended by 20 participants. On this day, a post-test was conducted to evaluate the impact of the health education provided over a one-week interval, using questionnaire scores as indicators. The outcomes were analyzed by comparing pre-test and post-test scores to determine the extent of knowledge and skill improvement following the intervention.

III. RESULT AND DISCUSSION

The community service activities were conducted in two sessions on August 22 and 29, 2025, at RT 26 RW 06, Pondok Jati, located within Jati Village, Sidoarjo Subdistrict, Sidoarjo Regency, and involved 20 individuals with diabetes mellitus. The characteristics of the community service participants are as follows: of the 20 participants, 13 were male and 7 were female, with ages ranging from 41 to 70 years. In terms of education, 9 participants had completed high school (SMA), 8 held a diploma (D3), and 3 had completed junior high school (SMP).

These demographic factors may have influenced participants' levels of comprehension and responsiveness to the educational interventions. Previous research has shown that individuals with higher educational backgrounds tend to demonstrate greater understanding of diabetes management concepts and adherence to treatment recommendations [10]. Conversely, participants with moderate educational levels often benefit more from practical demonstrations and visual learning strategies, which enhance comprehension and engagement in self-care education.

Furthermore, age-related differences may affect adaptability and the ability to translate new knowledge into daily self-care behaviors, particularly among older adults with chronic illnesses such as diabetes mellitus (Diabetologia, 2024). Therefore, analyzing these demographic variables enriches the interpretation of the educational outcomes and provides an essential basis for designing future community-based health education programs tailored to participant characteristics (Educational Characteristics in Medication Compliance Diabetes Mellitus in Indonesia, 2025).

Women generally tend to be more concerned about health issues compared to men. Their concern for health is not only directed toward themselves but also extends to their children, husbands, and families [10]. However, in this community empowerment program, the majority of respondents were male. Therefore, it cannot be concluded that women are more concerned about their health than men, as gender was not a dominant factor influencing the level of awareness

Age influences a person's ability to comprehend and think critically. As individuals grow older, their mental development tends to improve, allowing them to think and act with greater wisdom and maturity. Consequently, the knowledge they acquire broadens their insight and understanding. The various forms of knowledge gained throughout earlier stages of life combined with personal and social experiences, as well as environmental and other influencing factors serve as a foundation that sustains and strengthens a person's understanding over the decades, even into old age.

In addition to gender, age plays a crucial role in shaping a person's cognitive development and thinking patterns [11]. As individuals grow older, their mental processes and reasoning abilities generally become more mature and well-developed. Older adults tend to demonstrate greater reflective capacity in understanding their health conditions, including in the management of chronic diseases such as diabetes. Various life experiences, social interactions, and exposure to different environmental and informational factors serve as foundational elements that sustain and shape a person's knowledge and health behaviors over time. Thus, age significantly influences one's ability to absorb, comprehend, and apply health-related information effectively [11].

Educational level is another important determinant of how well individuals can receive, retain, and process health information. Higher education tends to correlate with a more rational and objective mindset when making health-related decisions. Individuals with advanced education levels are generally more inclined to trust modern medicine that has been clinically tested rather than relying on traditional remedies without scientific validation. Moreover, those with higher education are more likely to think critically and verify information before accepting it as true. As educational attainment increases, intellectual capacity also rises, which enhances an individual's ability to make well-informed

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decisions regarding healthy behaviors and the safe, evidence-based use of therapeutic approaches [11].

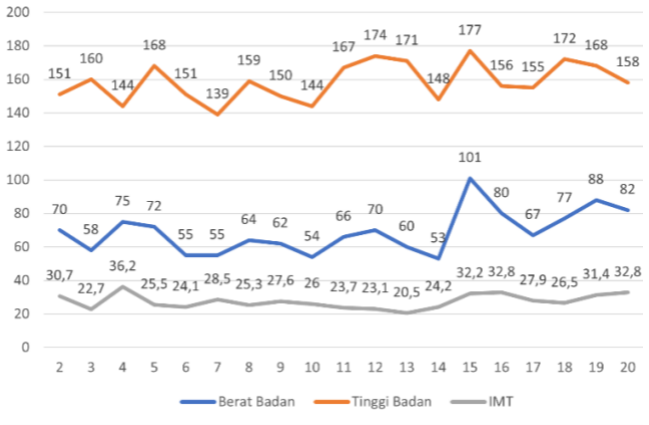

FIGURE 5 Body weight, height, and BMI data of participants

TABLE 1
Data On Duration Of Diabetes Mellitus, Medication adherence And Compliance Withe Health Service Visits Among PeopleWith Diabetes Mellitus In The 2025 Community Service Program (n=25)

Category		Frequency	Percentage
Duration of DM	< 6 months	9	45
	6 months–1 year	2	19
	> 1 year	9	45
Medication Adherence	Prescription Medication	18	95%
	Traditional Medicine	0	0%
	Combination	2	5%
Adherence to Health Service Check-ups	Clinic	8	40%
	nunity Health Center (Puskesmas)	5	25%
	Hospital	7	35%

A. Body Weight (BW), measured using a digital scale

The body weight of individuals with diabetes mellitus (DM) varied widely, ranging from 53 kg to 101 kg. The mean body weight was approximately 69.1 kg, with a median of 62 kg, indicating that most participants had a body weight above 50 kg. However, there were some extreme values, particularly 101 kg, which were considerably higher than the mean and could influence data distribution.

B. Height (HT), measured using a measuring tape

Height among DM participants ranged from 139 cm to 177 cm, with an average of approximately 159 cm. The lowest recorded height was 136 cm. The majority of participants (around 55%) were between 150–168 cm, indicating a fairly concentrated distribution within this range.

C. Body Mass Index (BMI), calculated to determine nutritional status (kg/m²)

Based on the WHO Asia-Pacific BMI classification, 7 participants (35%) were classified as normal, 7 participants (35%) as overweight, and 6 participants (30%) as obese. These results indicate that nearly half of the DM participants fell within the normal to obese range, which may be a risk factor for non-communicable diseases such as hypertension, diabetes mellitus, and heart disease. Most DM participants classified as obese had a body weight ≥60 kg with a height below 170 cm, resulting in a relatively high BMI.

According to the information in TABLE 1, there are several result :

D. Duration of Diabetes Mellitus (DM)

Based on the analysis, the distribution of DM duration among participants in the community service program indicated that a small portion (10%) had been diagnosed with DM for 6 months to 1 year. Nearly half of the participants (45%) had a duration of DM of more than 6 months, suggesting that this group was in the early adaptation phase to a chronic condition.

The data also show that the majority of participants had been living with DM for more than one year, meaning they had passed the initial adaptation phase and required ongoing education to prevent long-term complications. Participants with a shorter disease duration needed reinforcement of basic knowledge regarding treatment adherence and self-care behavior formation, whereas those with a longer disease duration required support in maintaining healthy behaviors and managing complications.

E. Medication Adherence

Participants in the community service program demonstrated very high medication adherence. Approximately 95% of respondents reported taking prescribed medications, while 5% reported using both prescribed and traditional medications. Screening results indicated that 100% of participants were adherent to their medication regimen. This high level of medication adherence is a positive indicator of the effectiveness of the education and care support provided. Pharmacological therapy adherence in DM patients is essential for achieving optimal glycemic control and preventing long-term complications. These results imply that patient empowerment through structured education and motivational reinforcement is crucial for sustaining long-term medication adherence.

F. Adherence to Health Service Check-ups

Participants also exhibited a very high level of adherence to health service visits, with 100% reporting that they attended check-ups at hospitals, clinics, or community health centers (Puskesmas). This high adherence to health service utilization is a positive indicator of the program's educational effectiveness. Regular, independent monitoring and check-ups re essential for achieving optimal glycemic control and preventing long-term complications in individuals with DM.

G. Diabetes Screening

Participants in the community service program underwent blood glucose level (GDA) measurement using a glucometer. Normal GDA values were defined as not exceeding 200 mg/dL. The results showed that the majority of participants (65%) had GDA values below 200 mg/dL, while 35% had GDA values above 200 mg/dL, with the highest recorded value being 348 mg/dL.

H. Hypertension Screening

Blood pressure measurements were performed using a sphygmomanometer. Normal blood pressure was defined as not exceeding 139/89 mmHg. Results indicated that 60% of participants had normal blood pressure, while 40% exhibited elevated blood pressure, with the highest measurement being 152/92 mmHg.

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I. Cholesterol Screening

Cholesterol levels were assessed, with normal reference values defined as < 200 mg/dL. Approximately 40% of participants had cholesterol values below 200 mg/dL, while the majority (60%) had cholesterol levels above 200 mg/dL, with the highest value recorded at 272 mg/dL.

J. Uric Acid Screening

Uric acid levels were measured with reference values of < 6 mg/dL for females and < 7 mg/dL for males. Nearly half of the participants had uric acid levels within the normal reference

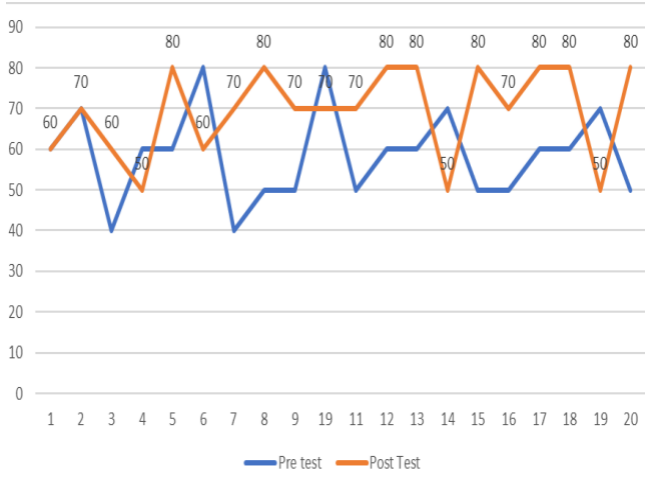

FIGURE 6. Knowledge Level Improvement of participants

Based on *Fig 6*, The pre-test findings indicated that participants' knowledge scores ranged from 40 to 80 on a questionnaire assessing diabetes mellitus (DM) management, with a focus on the use of family medicinal plants (Tanaman Obat Keluarga or TOGA) for blood glucose regulation and complication prevention. Such variation reflects disparities in participants' health literacy and behavioral practices [10]. The highest score of 80 suggests that some participants demonstrated comprehensive knowledge of DM management, including awareness of lifestyle modifications, pharmacotherapy, and the potential role of medicinal plants. This outcome highlights the presence of a subgroup within the community that had already internalized essential concepts of DM care, possibly due to previous exposure to health education programs or personal experience with the disease. Conversely, the lowest score of 40 illustrates significant gaps in understanding, with participants in this group at heightened risk of poor self-care, inadequate adherence, and long-term complications such as hyperglycemia, neuropathy, or cardiovascular disease [12].

The distribution of scores in the medium to high range also points to a partially informed community. While a majority of participants demonstrated adequate baseline knowledge, their understanding was often fragmented and inconsistent, particularly concerning the integration of complementary practices with conventional treatment. This underscores the need for structured health education that not only imparts factual knowledge but also builds capacity for critical decision-making and sustainable behavior change [13]. Medication adherence remains a central issue, as many DM patients struggle with fatigue, complex regimens, or adverse drug reactions, which can reduce motivation to maintain long-term treatment compliance. Addressing this barrier requires interventions that reinforce both knowledge and practical skills in daily self-management.

The post-test results demonstrated a notable improvement, with the minimum score increasing from 40 to 50. Although the maximum score remained constant at 80, several participants who previously scored below this threshold achieved the highest mark after the intervention. This finding confirms that the educational sessions, which included presentations, modules, and live demonstrations, were effective in raising participants' knowledge. The fact that the maximum score did not exceed 80 suggests a ceiling effect, a phenomenon often observed in evaluations where the assessment tool cannot adequately capture higher levels of improvement once participants approach the maximum attainable score [14]. Nevertheless, the overall outcome indicated a 65% increase in knowledge across the group, confirming the positive impact of the intervention.

Beyond knowledge acquisition, the intervention also emphasized behavioral reinforcement through coaching. This approach incorporated individual empowerment, emotional support, and the promotion of healthy dietary patterns, all of which are crucial for long-term adherence and effective DM control. Studies have shown that coaching-based methods can enhance patient motivation, self-efficacy, and sustained engagement in healthy behaviors, thereby reducing dependence on acute care services and lowering the risk of complications [15]. Integrating TOGA as part of this framework offers additional cultural relevance, as many Indonesian communities already maintain household medicinal gardens. Leveraging this local wisdom not only strengthens patient engagement but also ensures sustainability of the intervention [16].

These findings align with broader evidence that herbal medicine is frequently utilized by DM patients worldwide, either as a complement to pharmacotherapy or, in some cases, as a substitute [17]. While such practices can provide perceived benefits, they also carry risks of adverse interactions or insufficient glycemic control when used without proper guidance. This reinforces the critical role of community health cadres and nurses in providing education, monitoring adherence, and bridging the gap between traditional practices and evidence-based medicine [18]. Within the Indonesian context, these responsibilities are further supported by professional regulations that authorize nurses to integrate complementary and alternative nursing interventions into community-based care programs [19].

In summary, the results of this program demonstrate that structured education and coaching can significantly improve knowledge and self-management behaviors among DM patients, particularly in the safe and effective use of family medicinal plants. The combination of evidence-based education, cultural adaptation through TOGA, and personalized coaching represents a promising model for

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community service initiatives aimed at strengthening chronic disease management at the grassroots level.

TABLE 2
Evaluation Of Activities Among The Diabetes Mellitus Group In The 2025 Community Service Program (n=25)

Description	Frequency	Percentage
Fairly Satisfied	3	15%
Satisfied	17	85%

According to the information in TABLE 2, the results obtained from the evaluation of the community service program conducted in August 2025, aimed at increasing knowledge about herbal plants and their processing methods beneficial for controlling blood glucose levels among individuals with diabetes mellitus, showed that almost all participants (85%) were satisfied with the activities, while a small proportion (15%) reported having only a fair understanding of the materials delivered during the program.

IV. CONCLUSION

The community service program implemented demonstrated significant success in achieving its objectives, particularly in enhancing participants' knowledge and awareness regarding diabetes mellitus (DM) management. Pre-test and post-test evaluations revealed an increase of over 65% in understanding, especially concerning the use of family medicinal plants (TOGA) as a complementary therapy. This improvement highlights both the effectiveness of the educational strategies and the readiness of community members to adopt healthier practices when provided with proper guidance and resources. The combination of structured educational sessions, live demonstrations, and direct mentorship was crucial in ensuring that participants absorbed, internalized, and applied the information in their daily lives.

The outcomes of this program emphasize the importance of integrating health education into existing community structures. Routine activities, such as Posbindu, serve as strategic opportunities for ongoing education and empowerment. Incorporating instruction on the preparation and benefits of family medicinal plants, alongside reinforcement of practices such as blood glucose monitoring and adherence to treatment regimens, enables these community platforms to play a pivotal role in preventing complications and improving long-term disease management. Continuous mentorship and support from health cadres and professionals were identified as key factors in sustaining behavioral changes, as ongoing reinforcement is often necessary to maintain adherence and prevent relapse into unhealthy practices.

Another important implication of this program lies in its educational value for academic institutions, particularly in nursing and public health education. The experiences gained provide practical examples of evidence-based community empowerment. Integrating such initiatives into student learning bridges the gap between theoretical knowledge and practical application, preparing students to deliver holistic care and engage effectively with communities. This approach further enhances the role of higher education in fostering community resilience and supporting national efforts to improve public health through preventive and promotive measures.

In conclusion, the program successfully enhanced participant knowledge, encouraged improved self-care practices, and demonstrated the effectiveness of combining direct education, hands-on demonstrations, and sustained mentorship. This holistic approach to DM management can be adapted and scaled to other community settings, expanding its impact. Replicating and extending similar programs will not only improve individual health outcomes but also contribute to the development of sustainable, evidence-based strategies for chronic disease prevention and management within communities. By combining education, practical experience, and mentorship, such initiatives provide a model for empowering individuals and strengthening community capacity for long-term health improvement.

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