Swandari et al (2025)
Vol 13(1): 15716
https://doi.org/10.20884/1.api.2025.13.1.15716

Acta Pharmaciae Indonesia:
Acta Pharm Indo
E-ISSN 2621-4520

RESEARCH ARTICLE Open Access

Hospital pharmacists' perspectives on diabetes treatment barriers and solutions: A qualitative study from Indonesia

Mika Tri Kumala Swandari[1,2], Zakky Cholisoh[1*], Hidayah Karuniawati[1]

ABSTRACT

Background: Despite available treatment options, diabetes mellitus (DM) management faces significant barriers affecting patient outcomes. While most research focuses on patient factors, limited attention has been given to healthcare provider perspectives, particularly hospital pharmacists who are key stakeholders in diabetes care.

Objective: This study explored treatment barriers and solutions from hospital pharmacists' perspectives in Indonesia.

Methods: This qualitative phenomenological study involved 18 hospital pharmacists at Cilacap Regional General Hospital, Central Java, Indonesia. Participants were selected through purposive sampling and had minimum one-year experience in diabetes patient care. Semi-structured interviews were conducted from January to February 2025, audio-recorded, transcribed verbatim in Bahasa Indonesia, and analyzed using thematic analysis. All interviews were conducted in Bahasa Indonesia and participant quotes were translated to English while preserving original meaning and cultural context.

Results: Analysis of three predetermined barrier themes revealed: adverse drug reactions (ADRs) (particularly metformin-related gastrointestinal effects and insulin-associated hypoglycemia), medication non-adherence (influenced by feeling healed, treatment boredom, age-related denial, and therapy burden), and monthly follow-up challenges (geographic barriers, transportation difficulties, physical limitations, and insufficient family support). Pharmacists proposed comprehensive solutions including patient and family education, interprofessional collaboration, technology integration through WhatsApp support, and flexible monitoring approaches.

Conclusion: Pharmacist-identified barriers operate as interconnected system components requiring multi-level interventions. Evidence-based solutions emphasizing education, collaboration, family engagement, and technological support can enhance diabetes management outcomes while respecting cultural contexts and resource constraints.

Keywords: hospital pharmacist, diabetes mellitus patient, solutions, treatment barriers

Introduction

Diabetes mellitus (DM) represents one of the most pressing global health challenges of the 21st century. According to the International Diabetes Federation (IDF) Diabetes Atlas, the worldwide prevalence of diabetes in people aged 20 to 79 years is estimated at 10.5% (536.6 million people) in 2021, with projections indicating a substantial increase to 12.2% (783.2 million people) by 2045. This alarming trend is particularly evident in Indonesia, which currently ranks fifth among countries with the highest diabetes cases globally, with 19.5 million cases in 2021 and projected to reach 28.6 million by 2045 [1].

The increasing prevalence of diabetes mellitus demands urgent attention, given its classification as a chronic, life-threatening condition that significantly compromises patients' quality of life and can lead to severe complications including stroke, kidney failure,

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Muhammadiyah Surakarta, Indonesia

[2]Faculty of Pharmacy, Science and Technology, Al-Irsyad University, Cilacap, Indonesia

*Corresponding author: Zakky Cholisoh.
Email: zakky.cholisoh@ums.ac.id

and premature mortality. While various evidence-based treatment options are available, effective diabetes management faces substantial barriers spanning patient-related factors, healthcare provider challenges, and systemic healthcare delivery issues. The complexity of diabetes requires disciplined, long-term treatment strategies to prevent life-threatening complications, making the identification and resolution of treatment barriers critical for optimal patient outcomes [2].

Patient non-adherence to prescribed therapies, inadequate understanding of blood glucose control importance, and challenges with medication access and availability represent frequently encountered obstacles in diabetes care [3]. Research by Hutasuhut in 2024 demonstrates that accessible healthcare services significantly enhance treatment adherence among type 2 diabetes patients, highlighting how geographical barriers between patients' residences and healthcare facilities can substantially impede routine blood glucose monitoring [4]. Additionally, the psychological burden of continuous medication intake and mandatory monthly monitoring creates internal constraints that further compromise adherence to diabetes medication therapy [5].

Effective management of type 2 diabetes mellitus necessitates coordinated care involving multidisciplinary healthcare teams, including physicians, nurses, nutritionists, pharmacists, and psychologists working collaboratively with patients and their families. Healthcare practitioners must provide individualized therapy aligned with evidence-based disease management guidelines while addressing the unique needs and circumstances of each patient [6]. The Indonesian Ministry of Health Regulations of 2014 (numbers 30, 35, and 58) establish pharmaceutical service standards across health centers, pharmacies, and hospitals, mandating pharmacists to enhance their pharmaceutical care capabilities through expanded clinical services including medication counseling and therapeutic monitoring [7].

Pharmacists occupy a strategic position in diabetes care delivery, serving as accessible healthcare professionals directly involved in the treatment process. Their expanded role encompasses patient education regarding proper medication use, identification of therapy-related problems, and provision of ongoing support throughout the treatment journey [8]. Community and clinical pharmacists contribute significantly to diabetes management success by accompanying, counseling, and collaborating with patients in medication therapy optimization [9].

From a pharmacotherapy perspective, pharmacists provide comprehensive medication information including brand and generic options, therapeutic benefits and mechanisms of action, onset of effects, administration routes, dosage forms, proper usage instructions, potential side effects, drug interactions, and storage requirements [10]. Beyond pharmacological interventions, pharmacists deliver valuable non-pharmacotherapy education covering disease pathophysiology, potential complications and associated risks, essential self-care practices, routine monitoring requirements, stress management techniques, dietary modifications, and appropriate physical activity regimens for optimal blood glucose control [11].

Evidence from Rahmawaty's 2023 study emphasizes that pharmacist-provided counseling significantly enhances medication adherence, underscoring the necessity of investigating obstacles faced by diabetes patients to develop targeted interventions [12]. Wahyuningrum et al. (2016) further advocate for pharmacists to systematically explore medication non-compliance issues among diabetes patients to facilitate comprehensive identification and resolution of treatment barriers [13].

Despite the recognized importance of pharmacist involvement in diabetes care, significant knowledge gaps persist in understanding treatment barriers from the healthcare provider perspective. Most existing research has concentrated on patient-related factors affecting medication adherence, with limited attention devoted to the experiences and insights of pharmacists as key healthcare providers in diabetes management. Furthermore, studies exploring diabetes treatment barriers from hospital pharmacists' viewpoints, particularly within regional public hospitals in Indonesia's healthcare system, remain notably scarce.

The Indonesian healthcare context presents unique challenges including diverse geographical distributions, varying socioeconomic conditions, and healthcare system complexities that may influence diabetes treatment barriers differently than in other settings. Hospital pharmacists in regional facilities often serve as primary points of contact for diabetes patients, making their perspectives particularly valuable for developing contextually appropriate interventions.

This study addresses these critical knowledge gaps by systematically exploring the experiences and insights

of hospital pharmacists in identifying and addressing treatment barriers for type 2 diabetes mellitus patients. Through in-depth qualitative investigation, this research aims to: (1) identify key treatment barriers encountered in diabetes care from pharmacists' perspectives, (2) explore pharmacist-led solutions to overcome these barriers, and (3) provide evidence-based recommendations for enhancing diabetes treatment effectiveness and improving patient outcomes. The findings will contribute to the development of comprehensive, pharmacist-centered interventions that can be integrated into existing healthcare delivery systems to optimize diabetes management and enhance patients' quality of life.

Methods

Research design

This qualitative study employed a phenomenological approach to explore pharmacists' lived experiences and perspectives in addressing treatment barriers among type 2 diabetes mellitus patients. The phenomenological design was selected as it allows for in-depth exploration of participants' subjective experiences and the meanings they assign to their professional encounters with diabetes patients. Semi-structured, in-depth interviews were conducted as the primary data collection method to capture rich, detailed accounts of pharmacists' experiences and insights.

Prior to study initiation, the research protocol received ethical approval from the Health Research Ethics Committee, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, with ethical clearance statement No.270/KEPK-FIK/VI/2024. All participants provided written informed consent before participation, and confidentiality was maintained throughout the research process.

Location and selection of informants

This research was conducted at Cilacap Regional General Hospital (RSUD), a major public healthcare facility located in Central Java, Indonesia. The hospital serves as a referral center for the Cilacap region and provides comprehensive diabetes care services including outpatient clinics, inpatient management, and pharmaceutical services. The selection of this setting was purposeful, as regional public hospitals in Indonesia typically manage a high volume of diabetes patients and employ pharmacists with extensive experience in diabetes medication management. The hospital's pharmacy department operates with established protocols for diabetes patient care, including medication counseling services, therapeutic monitoring, and patient education programs, providing an optimal environment for exploring pharmacists' experiences with diabetes treatment barriers and solution development.

Participants were selected using purposive sampling, a non-probability sampling technique that allows for deliberate selection of information-rich cases relevant to the research objectives. This sampling approach was chosen to ensure recruitment of pharmacists with substantial experience in diabetes patient care who could provide valuable insights into treatment barriers and solutions. Selected participants were approached through a systematic recruitment process involving official authorization through formal request letters submitted to hospital management and the pharmacy department, direct coordination with pharmacy department leadership to identify eligible participants, and multiple contact methods including internal hospital communication systems, pharmacist WhatsApp professional groups, face-to-face invitations during routine pharmacy department meetings, and individual personal invitations through department coordinators. All contact emphasized the voluntary nature of participation and provided clear information about study purposes, procedures, and time commitments.

Participants were required to meet specific inclusion criteria including: i) professional status as licensed pharmacists currently employed at Cilacap Regional General Hospital with active involvement in diabetes patient pharmaceutical care, ii) minimum of one year of professional experience in pharmaceutical care specifically related to diabetes mellitus treatment to ensure adequate understanding of treatment challenges and patient interactions, iii) direct experience providing education to diabetes patients regarding disease management, medication use, and lifestyle modifications, active involvement in monitoring treatment effectiveness, medication adherence, and clinical outcomes for diabetes patients, and iv) voluntary consent to participate in audio-recorded interviews and share professional experiences.

The target sample size was established at 18 participants, representing all pharmacists employed in the hospital's diabetes care services. This comprehensive

sampling approach was chosen because previous qualitative research suggests that data saturation typically occurs within 12-18 interviews in homogeneous professional groups, including all eligible pharmacists ensures representation of diverse experiences and perspectives within the department, and full departmental participation provides comprehensive understanding of institutional practices and challenges.

While purposive sampling was appropriate for this study's objectives, potential limitations include selection bias where participants may represent those most willing to share experiences, potentially excluding more reserved perspectives, single-site limitation where recruitment from one hospital may limit transferability to other healthcare settings, and professional homogeneity where all participants share similar educational backgrounds and work environments, potentially limiting perspective diversity.

Data collection

Semi-structured interviews were conducted from January 2025 to February 2025. An interview guide was used during the interviews (Supplement 1). The instrument consisted of a predefined list of open-ended questions to explore treatment barriers and solutions to overcome them. The interview guide covered key topic areas while providing flexibility to explore unexpected issues. The interview guide was reviewed and validated by a panel of experts and academics. Pilot interview guidelines were applied as a pilot study with 10 test participants, who were not included in the final analysis. Target participants were contacted to schedule definite appointments before the interviews. The location of the interviews was the counseling room at Cilacap Hospital. Written consent was obtained before each interview. All interviews were audio-recorded and documented with written notes. Semi-structured interview questions were asked to obtain in-depth responses about obstacles to diabetes mellitus treatment and the solutions implemented. Each interview lasted 1 to 1.5 hours. No repeat interviews were required as all responses were sufficiently detailed and clear. Data saturation was considered to have been achieved after the 18th interview, as no new information or themes emerged. Transcripts were not returned to participants for comment or correction, but key points were clarified during interviews when necessary.

Data analysis

All data in this study were anonymized to maintain the confidentiality and privacy of participants, then transcribed manually using a thematic analysis approach [14]. The analysis process began with familiarization with the data, where researchers read and re-read the interview transcripts in depth to understand the context, meaning, and nuances of the words spoken by the participants. This repeated reading aimed to capture both explicit and implicit information in the qualitative data. During this process, researchers began to identify potential patterns and meanings that emerged, as well as form an initial understanding of the direction in which themes might evolve.

The next step was to create initial codes based on the information found in the transcripts. The coding process was carried out systematically by marking relevant and meaningful data segments related to the research focus. Once all data were encoded, the researchers reviewed all codes and grouped them to develop initial themes. These themes were developed by considering the relationships between codes and how the set of codes represented certain aspects of the participants' experiences. Thematic data coding was conducted independently by two researchers. After initial coding, both researchers compared and discussed their coding results to reach consensus on emerging themes. Discrepancies were resolved through discussion and agreement to ensure reliability.

Codes and themes that were formed were not immediately considered final. Instead, researchers conducted an ongoing process of reflection and review to ensure that the resulting themes truly represented the data authentically and in depth. This process was carried out collaboratively, where all authors engaged in intensive discussions to compare interpretations, harmonize understandings, and refine the themes that were formed.

To improve the validity and credibility of the findings, interview transcripts were sent back to participants for clarification. Through this process, participants could review the transcripts and provide feedback, especially if they found parts that were inaccurate or did not align with their intent. Input from participants was an important consideration in refining the analysis and ensuring that the interpretation made by researchers followed the reality intended by the participants.

Table 1. Demographic characteristics of participants

Variable	Category	N (18)	Percentage (%)
Gender	Male	2	11.1
	Female	16	88.9
Education	Pharmacist	16	88.9
	Master's degree + Pharmacist	2	11.1
Age (years)	26-33	13	72.2
	34-42	1	5.6
	43-50	2	11.1
	51-59	2	11.1
Duration of Practice	1-5 years	5	27.8
	>5-10 years	9	50.0
	>10-15 years	1	5.6
	>20 years	3	16.7
Employment Status	Civil servant	13	72.2
	Non-civil servant	5	27.8
Total		**18**	**100.0**

Results

Participant characteristics

A total of 18 pharmacists participated in this study, representing the complete population of pharmacists involved in diabetes care at Cilacap Regional General Hospital. The demographic characteristics of participants are presented in Table 1. The majority of participants were female (88.9%, n=16), with two male participants (11.1%). Most participants held a pharmacist degree (88.9%, n=16), while two participants (11.1%) had obtained master's degrees in addition to their pharmacist qualifications.

The age distribution showed that the largest group of participants were in the 26-33 years age range (72.2%, n=13), followed by smaller groups in the 51-59 years range (11.1%, n=2), 43-50 years range (11.1%, n=2), and 34-42 years range (5.6%, n=1). Regarding professional experience, half of the participants (50.0%, n=9) had 5-10 years of practice experience, while 27.8% (n=5) had 1-5 years of experience. A smaller proportion had more extensive experience, with 16.7% (n=3) having more than 20 years of practice and 5.6% (n=1) having 10-15 years of experience. The majority of participants were civil servants (72.2%, n=13), while 27.8% (n=5) were non-civil servant employees.

Thematic analysis results

The thematic analysis revealed three primary themes representing significant barriers to diabetes mellitus treatment from pharmacists' perspectives, along with corresponding solutions proposed by participants. These themes encompassed adverse drug reactions (ADRs), medication non-adherence, and challenges with monthly medical follow-up. Each theme incorporated multiple sub-themes that provided detailed insights into the complexity of diabetes care barriers and potential interventions. The comprehensive analysis of treatment barriers and pharmacist-proposed solutions is summarized in Table 2.

Theme 1: Adverse drug reactions (ADRs) as treatment barriers

Adverse drug reactions (ADRs) emerged as a primary concern affecting diabetes treatment adherence and patient comfort. Participants consistently reported receiving complaints from patients regarding medication side effects, with metformin being the most frequently cited problematic medication. The gastrointestinal effects of metformin, including nausea, stomach discomfort, and diarrhea, were commonly experienced by patients and often led to treatment hesitation or discontinuation. One participant described

Table 2. Treatment barriers and pharmacist-proposed solutions for diabetes mellitus patients

Theme	Barrier sub-themes	Participant quotations (barriers)	Proposed solutions	Participant quotations (solutions)
1. Adverse drug reactions (ADRs)	• Gastrointestinal effects (nausea, diarrhea) • General weakness • Hypoglycemia	*"Oh, yes. Metformin also causes nausea, and the stomach is full, that's it"* (N2, 26-year-old female). *"Hypoglycemia after insulin use"* (N1, 33-year-old female).	• Patient education on side effect management • Interprofessional collaboration for therapy adjustment • Medication substitution with physician approval • Emergency management protocols	*"As pharmacists, we first identify which medication causes the side effect and check if it's being taken correctly. For mild effects like nausea, we advise taking the medication with meals. We also educate patients on when and how to take their medication, what side effects to expect, and how to respond—for example, managing hypoglycemia with sweet foods or drinks. If the side effects are severe, the patient should consult the doctor to consider changing the medication"* (N14, 29-year-old female).
2. Medication non-adherence	• Feeling healed or healthy • Treatment boredom • Lack of immediate results • Denial (especially young patients) • Burden of long-term therapy • Complex injection schedules	*"Yes, patients often feel they are already healed, become tired or bored with treatment, and some still feel frustrated because their blood sugar levels remain high despite taking medication"* (N3, 30-year-old female). *"Young patients still have a sense of denial. So there is still a sense of rejection. Why did he get sick when he was young, right? But by explaining that it doesn't have to be because of age. Maybe from his lifestyle as well"* (N7, 47-year-old female)	• Comprehensive patient and family education • Motivational counselling • Family involvement as support system • Direct pharmacist contact (WhatsApp) • Individualized medication records • Regular follow-up and monitoring	*"Pharmacists emphasize counseling patients and their families on the importance of taking DM medication regularly to avoid complications. They motivate patients by highlighting the risks of non-compliance and the long-term benefits of consistent treatment. Strategies include creating patient medication records to personalize therapy, asking about leftover medications during follow-up, and encouraging patients to share complaints during outpatient visits"* (N1, N3, N17, N18)
3. Monthly medical follow-up challenges	• Geographic barriers (distance) • Transportation difficulties • Time constraints • Physical limitations • Psychological factors (anxiety, fatigue) • Lack of family support • Administrative barriers	*"Continuous monthly monitoring, living away from the hospital, and schedule control in conjunction with other activities"* (N7, 47-year-old female) *"Long home distance, depart each control alone. Lack of family support"* (N6, 33-year-old female). *"The obstacle is because of the long distance, and also laziness, as the control has been boring for a long time"* (N15, 26-year-old female).	• Family education and involvement • Flexible monitoring options • Technology-assisted registration • Alternative healthcare facilities • Transportation assistance • Appointment reminders • Preparation support	*"Pharmacists recommend assisting elderly patients with online registration (JKN Mobile) and clearly marking control dates to avoid confusion. They encourage involving family or neighbors to help with transportation and emphasize the importance of preparation and reminders for scheduled visits. Education is also extended to families as a support system, and patients can be referred to nearby health workers if accessing the hospital is difficult"* (N18, N15, N10, N8)

the typical patient experience: *"Oh yes. Metformin also causes nausea, and makes the stomach feel full, that's it"* (N2, 26-year-old female). Additionally, participants noted that patients receiving insulin therapy frequently reported hypoglycemic episodes, which created anxiety and reluctance to continue with prescribed regimens. Another participant specifically mentioned insulin-related complications: *"Hypoglycemia after using insulin"* (N1, 33-year-old female).

These adverse effects not only caused physical discomfort but also contributed to psychological barriers, as patients developed fear and apprehension about continuing their medications. The impact of ADRs extended beyond individual patient discomfort to affect overall treatment outcomes. Participants observed that patients who experienced significant side effects were more likely to miss doses, reduce medication frequency, or discontinue treatment altogether without consulting healthcare providers. This pattern of behavior created a cycle where poor medication adherence led to inadequate glycemic control, potentially necessitating more intensive interventions or alternative treatment approaches.

Pharmacists proposed comprehensive solutions to address ADRs, emphasizing education as the cornerstone of effective management. Their approach involved systematic identification of problematic medications, assessment of proper administration techniques, and provision of practical strategies for side effect mitigation. As one experienced pharmacist explained in detail: *"When there's a patient experiencing medication side effects, first, as a pharmacist, we need to identify which medication is causing the side effects and whether the patient is taking the medication correctly. Second, once we know which medication is causing the side effects, if the side effects are mild like nausea, the patient can take the medication with food, like metformin and acarbose. Third, we can educate patients about when and how to take medication properly and inform them about the side effects of each medication they're taking, so patients can understand and handle the side effects that occur. For example, if there are signs of hypoglycemia like dizziness, tremors, or tingling lips, patients can eat candy or drink sweet tea. Fourth, if the side effects are quite serious, then the patient needs special attention and should consult with the prescribing doctor about whether the medication can be changed to another class. Especially if the effects are very disturbing, they can immediately go to the emergency room for proper treatment"* (N14, 29-year-old woman).

Another pharmacist emphasized the importance of patient education and medical consultation: *"We educate patients when there are side effects from diabetes medications. First, we provide solutions for the occurring side effects by explaining the medication given to overcome those side effects. Second, if the side effects get worse, then we consult with the prescribing doctor about whether to stop or change the medication"* (N3, 30-year-old woman). This comprehensive approach demonstrates the multifaceted nature of pharmacist interventions in managing medication-related barriers.

Theme 2: Medication non-adherence challenges

Medication non-adherence represented a complex, multifaceted barrier influenced by psychological, social, and practical factors. Participants identified several distinct patterns of non-adherence among diabetes patients, each requiring tailored intervention strategies. The most commonly reported reason for non-adherence was patients' perception of being cured or healthy, particularly when they experienced symptom improvement or achieved temporary glycemic control. As one participant explained: *"Usually patients feel they're already healed, then get bored, and some feel they've taken medication but their blood sugar hasn't gone down"* (N3, 30-year-old woman). This misconception led to premature treatment discontinuation and subsequent deterioration of diabetes management.

Age-related differences in non-adherence patterns were particularly notable. Young patients often exhibited denial and rejection of their diagnosis, struggling to accept the reality of having a chronic condition at an early age. One participant provided detailed insight into these challenges: *"For young patients, they still have denial. So there's still rejection. Why did they get this disease at such a young age? But by explaining that it doesn't have to be because of age, maybe it's also from their lifestyle. Little by little, they can accept it. Now for elderly patients, they feel this way because the treatment is long-term. So there's a feeling, there are times when they get bored. Or when patients get insulin injections, for example up to 3 times a day. Sometimes during the day when they're doing activities, they have to take time to do the injections"* (N7, 47-year-old woman). Conversely, older patients faced different challenges, including treatment fatigue from long-term therapy and the practical burden of complex medication regimens, particularly multiple daily insulin injections.

The solutions proposed by pharmacists emphasized a holistic approach incorporating education, motivation, family involvement, and ongoing support systems. One participant described their counseling approach: *"Counseling about the importance of taking medication, making them afraid of the consequences if they don't regularly take diabetes medication as motivation to keep taking their medication regularly"* (N1, 33-year-old woman). Another emphasized family involvement: *"Usually by educating the patient or the patient's family, to always encourage the patient to take medication regularly. Because if you don't take medication regularly, blood sugar will keep rising and it will cause other diseases"* (N3, 30-year-old female).

Innovative strategies included creating individualized patient records, as one pharmacist suggested: *"The solution could be this, ma'am, we make a book to gather patient information along with their history, so we can direct what the therapy should be like"* (N17, 33-year-old woman). Another participant described comprehensive follow-up approaches: *"First, when they come back for control visits, we ask about their remaining medications from before. Second, we direct patients when they come for control at the hospital to bring the medications they've been taking. Third, patients are asked to tell us again about the complaints they experienced during their outpatient treatment. While they're at home, what are their complaints? That's the solution there."*

The most innovative approach involved providing direct pharmacist contact for ongoing support, as one participant elaborated: *"So we provide our WhatsApp number if they need it, they can consult anytime. For boredom, we have to give patients motivation. Patient motivation to have fighting spirit, to have the fighting power to survive, to be able to survive with the hope that they can be more resilient, more resilient so they can worship, do more worship like that"* (N18, 46-year-old woman). This quote demonstrates the cultural sensitivity and holistic approach pharmacists employed in their motivational strategies.

Theme 3: Monthly medical follow-up barriers

Regular monthly medical follow-up appointments are essential for effective diabetes management, yet participants identified numerous barriers that prevented patients from maintaining consistent monitoring schedules. Geographic barriers represented the most significant challenge, particularly for patients living in rural areas distant from the hospital. One participant summarized multiple barriers: *"Continuous monthly control, living far from the hospital, and control schedules conflicting with other activities"* (N7, 47-year-old female). Another participant specifically highlighted social support issues: *"Long distance from home, going to each control visit alone. Lack of family support"* (N6, 33-year-old female).

Transportation difficulties, including lack of personal vehicles, unreliable public transportation, and financial constraints related to travel costs, further compounded access problems. Physical limitations, especially among elderly patients, created additional barriers to regular follow-up. Participants noted that patients with mobility restrictions, visual impairments, or other comorbid conditions found it increasingly difficult to travel to the hospital for routine appointments. These physical challenges were often exacerbated by psychological factors, as one participant explained: *"The obstacle is the long distance, and also laziness because they've been doing control visits for a long time and get bored"* (N15, 26-year-old woman).

The comprehensive solutions proposed by pharmacists addressed both practical and systemic barriers to follow-up care. Technology integration played a crucial role, with one participant providing detailed explanation of their support process: *"First, when they come for their first control visit, after finishing with the doctor, they already get a control letter. So we suggest they immediately go to the registration section at medical records for help with online registration. Because for these elderly patients, sometimes they have difficulty using the digital facilities implemented at Cilacap Hospital, since now BPJS requires all registration to use JKN Mobile. These elderly patients experience difficulties with using digitalization like this. That's the first thing. So they hope to get a quota for the next month's control. Second, on the control letter date, right in the control date section, we put a big circle mark, so patients can see the date there because there are two dates that sometimes confuse them. Third, if they have difficulties with coming to the hospital for control, they can ask for help from neighbors or family who can help them or directly order Gojek, Gocar, like that to go directly to the hospital"* (N18, 46-year-old woman).

Family and community involvement emerged as essential solution components. One participant emphasized: *"We educate again, ma'am. Both the patient and their family as a support system. Also maybe asking their family to be able to accompany them, like that"*

(N15, 26-year-old woman). Another provided practical advice for addressing patient motivation: *"The solution if it's because of laziness, means their family must also be educated to provide support. Then if it's because of long distance, yes, they're educated to prepare. Control visits can't be sudden, ma'am. So they're reminded. And tomorrow don't forget, ma'am, on this date there's a control visit"* (N10, 28-year-old female).

Alternative care delivery models were also proposed, as one participant suggested: *"They can get education from other health workers. For example, they don't have to go to the hospital like that, they can get education from other health workers like that"* (N8, 59-year-old woman). This approach recognized the importance of accessible healthcare while maintaining quality diabetes monitoring and education.

Integration of findings

The three identified themes demonstrate the interconnected nature of diabetes treatment barriers and the need for comprehensive, multi-level interventions. ADRs can trigger non-adherence, which in turn may lead to poor outcomes that discourage regular follow-up visits. Conversely, improved follow-up care can facilitate better side effect management and adherence support. The pharmacist-proposed solutions reflect this interconnectedness by emphasizing education, communication, family involvement, and system-level improvements that address multiple barriers simultaneously.

The findings highlight pharmacists' unique position in diabetes care delivery, possessing both clinical expertise and practical understanding of patient challenges. Their proposed solutions demonstrate feasibility and sustainability, incorporating available technologies and existing healthcare infrastructure while recognizing resource limitations and cultural contexts specific to the Indonesian healthcare system.

Discussion

This qualitative study provides valuable insights into the complex landscape of diabetes mellitus treatment barriers from the perspective of hospital pharmacists in Indonesia, revealing three interconnected themes that significantly impact patient care outcomes: ADRs, medication non-adherence, and monthly medical follow-up challenges. The findings demonstrate that these barriers are not isolated phenomena but rather components of an integrated system where each element influences and amplifies the others, requiring comprehensive, multi-level interventions to achieve optimal diabetes management.

The prominence of ADRs as a primary treatment barrier aligns with existing literature while providing unique insights into the Indonesian healthcare context [15]. Our findings confirm that metformin-associated gastrointestinal effects, including nausea, stomach discomfort, and diarrhea, represent significant obstacles to treatment adherence, consistent with established research documenting these complications [17]. The frequent occurrence of insulin-related hypoglycemia reported by participants further emphasizes the complexity of diabetes pharmacotherapy and its impact on patient comfort and treatment continuation [16]. However, this study extends beyond merely identifying these reactions to explore pharmacist-led solutions that demonstrate practical applicability within resource-constrained healthcare settings.

The comprehensive educational approach proposed by participating pharmacists represents a paradigm shift from traditional medication dispensing toward patient-centered pharmaceutical care. Their systematic method of identifying problematic medications, assessing administration techniques, and providing practical management strategies reflects evidence-based practice principles that can significantly improve treatment outcomes [18]. The emphasis on interprofessional collaboration for therapy adjustment, as suggested by participants, aligns with contemporary healthcare delivery models that recognize the importance of coordinated care in chronic disease management [19] [20]. This collaborative approach becomes particularly relevant in the Indonesian context, where pharmacists often serve as accessible healthcare providers who can bridge communication gaps between patients and physicians.

Medication non-adherence emerged as a multifaceted challenge encompassing psychological, social, and practical dimensions that vary significantly across patient demographics. The age-related differences in non-adherence patterns identified by participants provide important insights for developing targeted interventions. Young patients' denial and rejection of their diagnosis reflect broader psychological challenges associated with chronic disease acceptance, particularly when diagnosed during what are typically considered healthy life stages. This finding resonates

with psychological adaptation theories and suggests the need for age-appropriate counseling approaches that address both medical and emotional aspects of diabetes management [26]. Conversely, the treatment fatigue experienced by older patients highlights the burden of long-term therapy and the need for sustained motivation strategies that acknowledge the chronicity of diabetes while maintaining hope and quality of life.

The participants' observation that patients often discontinue treatment when feeling healthy or when immediate results are not apparent underscores fundamental misunderstandings about diabetes pathophysiology and treatment objectives. This pattern reflects inadequate health literacy and emphasizes the critical role of ongoing patient education in maintaining long-term adherence [22][23]. The proposed solutions involving comprehensive patient and family education, motivational counseling, and direct pharmacist accessibility through digital platforms represent innovative approaches to addressing these knowledge gaps while providing ongoing support systems.

The integration of family involvement as a central component of adherence improvement strategies demonstrates cultural sensitivity and recognition of social determinants of health. Research consistently shows that family support significantly impacts diabetes management outcomes, with engaged family members serving as crucial advocates, motivators, and practical assistants in daily diabetes care [27][28]. The participants' emphasis on family education reflects understanding that diabetes management extends beyond individual patient behavior to encompass broader social support networks. This approach becomes particularly relevant in Indonesian cultural contexts where extended family involvement in healthcare decisions is common and expected.

The innovative use of digital communication platforms, specifically WhatsApp, for ongoing pharmacist-patient communication represents an adaptation to contemporary communication preferences while addressing accessibility barriers. This approach aligns with emerging telepharmacy models that have shown promise in improving medication adherence and patient satisfaction [29]. The provision of direct pharmacist contact information creates opportunities for immediate problem-solving and motivation, potentially preventing minor issues from developing into major adherence barriers. This model demonstrates how traditional pharmaceutical care can evolve to meet patient needs while working within existing resource constraints.

Monthly medical follow-up challenges revealed significant systemic barriers that extend beyond individual patient factors to encompass healthcare delivery infrastructure, geographic accessibility, and social support systems. The geographic barriers identified by participants reflect broader healthcare accessibility challenges common in developing countries, where specialized care is often concentrated in urban centers while patient populations are dispersed across rural areas [34]. The transportation difficulties, financial constraints, and physical limitations described by participants highlight how social determinants of health significantly impact chronic disease management outcomes.

The administrative barriers associated with digital registration systems present particular challenges for elderly patients who may lack technological literacy or access to digital devices. The participants' recognition of these barriers and their proactive approach to providing registration assistance demonstrates practical problem-solving and patient advocacy that extends beyond traditional pharmacist roles. This finding highlights the evolving nature of pharmaceutical care and the need for pharmacists to develop skills that address both clinical and social barriers to optimal care.

The comprehensive solutions proposed by participants for addressing follow-up barriers demonstrate systems thinking and recognition that sustainable improvements require coordinated interventions at multiple levels. The emphasis on family education and involvement reflects understanding that regular medical monitoring often requires practical and emotional support from others. The proposal for flexible monitoring options, including referral to nearby healthcare facilities, acknowledges resource limitations while maintaining commitment to ongoing patient care. This approach aligns with healthcare delivery models that emphasize accessibility and patient-centered care while working within existing infrastructure constraints.

The participants' use of digital reminders and preparation support reflects adaptation to available technologies while addressing practical barriers that prevent successful follow-up visits. The integration of social media platforms for appointment reminders represents an innovative approach to patient communication that leverages widely available technology to improve care coordination [35]. This

approach demonstrates how pharmacists can utilize existing resources creatively to address systemic barriers while providing personalized patient support.

The interconnected nature of the identified barriers suggests that effective interventions must address multiple challenges simultaneously rather than focusing on isolated problems. ADRs can trigger non-adherence, which may lead to poor glycemic control and subsequent reluctance to attend follow-up appointments. Conversely, improved follow-up care can facilitate better side effect management and provide opportunities for adherence counseling and motivation. This systemic perspective aligns with comprehensive chronic disease management models that recognize the complexity of factors influencing patient outcomes [30].

The solutions proposed by participants demonstrate feasibility and sustainability by incorporating available technologies, existing healthcare infrastructure, and cultural contexts specific to the Indonesian healthcare system. The emphasis on education, interprofessional collaboration, family engagement, and technological support reflects evidence-based approaches that have shown effectiveness in diverse healthcare settings [7]. These interventions can be implemented within current resource constraints while providing opportunities for incremental improvement in diabetes care quality.

The findings of this study have significant implications for pharmacy practice, healthcare policy, and diabetes management protocols. The identification of specific barriers and corresponding solutions provides a foundation for developing targeted interventions that can be adapted to similar healthcare contexts. The emphasis on pharmacist-led initiatives demonstrates the potential for expanding pharmaceutical care roles while improving patient outcomes. The integration of family involvement and digital communication platforms offers models for enhancing patient support systems within existing resources.

However, several limitations should be considered when interpreting these findings. The single-site design limits generalizability to other healthcare settings or regions with different demographic characteristics, healthcare infrastructure, or cultural contexts. The focus on pharmacist perspectives, while valuable, provides only one viewpoint in the complex ecosystem of diabetes care and may not fully capture patient experiences or other healthcare provider insights. The temporal limitations of data collection may not reflect seasonal variations or changes in healthcare delivery patterns that could influence barrier identification and solution effectiveness.

Future research should consider multi-site studies to enhance generalizability, incorporation of patient perspectives to provide comprehensive understanding of treatment barriers, intervention effectiveness studies to evaluate the impact of proposed solutions on clinical outcomes, and economic evaluations to assess the cost-effectiveness of pharmacist-led interventions. Additionally, longitudinal studies could provide insights into the sustainability and long-term effectiveness of implemented solutions.

Despite these limitations, this study makes important contributions to understanding diabetes treatment barriers in Indonesian healthcare contexts and provides practical, evidence-based solutions that can inform practice improvement initiatives. The comprehensive approach to barrier identification and solution development offers a model for addressing complex chronic disease management challenges while recognizing the central role of pharmacists in optimizing patient care outcomes. The findings demonstrate that pharmacist-driven interventions incorporating education, interprofessional collaboration, family engagement, and technological support can enhance treatment adherence, stabilize blood glucose control, and improve quality of life for diabetes patients when implemented within culturally appropriate and resource-conscious frameworks.

Conclusion

This study identified key barriers in diabetes mellitus treatment based on pharmacists' perspectives and solutions to overcome its barriers. The barriers consisted of medication side effects, non-adherence, limited education, and monthly control challenges. To address these barriers, pharmacists play a crucial role in providing proactive patient education and motivation, facilitating therapy adjustments, and improving communication through accessible platforms. Strengthening the role of pharmacists and interprofessional collaboration can improve treatment outcomes and enhance the quality of life for patients with DM.

Acknowledgment

We express our gratitude to the Rector of Al-Irsyad University Cilacap for the financial support of

this research and the Board Director of RSUD Cilacap for support, as well as to all the respondents who participated in this research.

Conflict of interest

The authors declare no conflict of interest.

Author contributions

MTKS: conceptualization, methodology, formal Analysis, investigation, resources, data curation, initial draft, data visualization. ZC: conceptualization, validation, review & editing, supervision. HK: conceptualization, validation, review & editing, visualization.

Received: April 20, 2025
Revised: July 22, 2025
Accepted: July 25, 2025
Published: August 28, 2025

References

1. CNBC Indonesia. (2022). *Indonesia Masuk 5 Besar Kasus Diabetes Tertinggi di Dunia*. Available from: https://www.cnbcindonesia.com/lifestyle
2. Putri IH, Jati SP, Martini M. Faktor Penghambat Pelaksanaan SPM Kesehatan pada Penderita Diabetes Mellitus: Literatur Review. Malahayati Nurs J. 2023;5(8):2804-2816. https://doi.org/10.33024/mnj.v5i8.10974
3. Della A, Subiyanto P, Maria A. Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Pengobatan Pasien Diabetes Melitus Tipe 2. J Keperawatan Klin dan Komunitas (Clinical Community Nurs Journal). 2023;7(2):124. https://doi.org/10.22146/jkkk.83090
4. Hutasuhut RF, Siregar PP. Kemudahan Akses Pelayanan Kesehatan Dapat Meningkatkan Kepatuhan Minum Obat Pasien Diabetes Melitus Tipe 2 di Puskesmas Medan Area Selatan. Pandu Husada. 2024;5(2):42-50.
5. Anshari AF, Ichsan B, Cholisoh Z. Hubungan Kepatuhan Minum Obat terhadap HbA1C dan Kualitas Hidup Pasien Diabetes di RSI Purwodadi. JPSCR J Pharm Sci Clin Res. 2023;8(3):317. https://doi.org/10.20961/jpscr.v8i3.73753
6. Soelistijo S. Pedoman Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 Dewasa di Indonesia 2021. Glob Initiat Asthma. 2021:46. Available from: www.ginasthma.org
7. Khairunnisa, Rawitri K, Wiryanto, Wahyuni S. Pengaruh Asuhan Kefarmasian Terhadap Outcome Klinis Dan Kualitas Hidup Pada Pasien Diabetes Melitus Tipe 2. JFIOnline. 2021;13(2):118-128. https://doi.org/10.35617/jfionline.v13i2.18
8. Wahyuningrum R, Wahyono D, Mustofa M, Prabandari YS. Pengelolaan Diabetes Melitus Tipe 2 Oleh Apoteker. JFIOnline. 2019;9(1). https://doi.org/10.35617/jfi.v9i1.550
9. Kamba V. Peran Apoteker dalam Meningkatkan Kepatuhan Berobat pada Pasien Diabetes Melitus. J Noncommunicable Dis. 2021;1(1):45. https://doi.org/10.52365/jond.v1i1.225
10. Putri MA, Sukandar EY. Pengaruh konseling apoteker terhadap kepatuhan terapi pasien diabetes melitus di beberapa puskesmas dan rumah sakit. 2024;4(3):275-286. https://doi.org/10.36805/jbf.v4i3.1130
11. Syafitri IW, Yasin NM, Sari IP. Pengaruh Edukasi oleh Apoteker dengan Metode Brief Counseling terhadap Pengetahuan, Kepatuhan dan Glukosa Darah Pasien DM Tipe 2 di Puskesmas Kabupaten Pemalang. J Manaj dan Pelayanan Farm (Journal Manag Pharm Pract). 2023;13(1):12. https://doi.org/10.22146/jmpf.74821
12. Rahmawaty A, Anggraeni NW. Pengaruh Konseling Apoteker Terhadap Tingkat Kepatuhan Minum Obat Dan Kadar Gula Darah Pasien Diabetes Mellitus. J Ris Kefarmasian Indones. 2023;5(1):181-193. https://doi.org/10.33759/jrki.v5i1.349
13. Wahyuningrum R, Wahyono D, Prabandari YS. Wawancara Motivasi Apoteker Untuk Kepatuhan Terhadap Pengobatan Diabetes Melitus Tipe 2. Pharmacon. 2016;5(2):191-195.
14. Fifi FF, Fitrisia A, Ofianto. Implementasi Thematic Analysis Melalui Langkah Coding Dalam Penelitian Kualitatif Pada Ilmu Sosial. FisiPublik: Jurnal Ilmu Sosial dan Plitik. 2023;8(1):443-453
15. Putra RJS, Achmad A, Pramestutie HR. Kejadian Efek Samping Potensial Terapi Obat Anti Diabetes Pada Pasien Diabetes Melitus Berdasarkan Algoritme Naranjo. Pharm J Indones. 2017;2(2):45-50. https://doi.org/10.21776/ub.pji.2017.002.02.3
16. Faria HTG, Rodrigues FFL, Zanetti ML, Araujo MFM, Damasceno MMC. Adherence to diabetes mellitus treatments in family health strategy units. Rev da Esc Enferm. 2014;48(2):254-260. https://doi.org/10.1590/S0080-623420140000200009
17. McCreight LJ, Bailey CJ, Pearson ER. Metformin and the gastrointestinal tract. Diabetologia. 2016;59(3):426-435. https://doi.org/10.1007/s00125-015-3844-9
18. Setyawan FSF, Subagiyo A, Lakoan MR. The Role of Pharmacists In Pharmaceutical Services: A Literature Review. International Journal of Society Reviews. 2024;2(8):2263-2275.
19. Kurniasih DAA, Sinta I, Syania S, Andini H, Setiawati EP. Peran Apoteker dalam Kolaborasi Interprofesi: Studi Literatur. Maj Farm. 2022;18(1):72. https://doi.org/10.22146/farmaseutik.v18i1.71900
20. Helgesen AK, Nome CM, Stenbjerg JK, Arnesen MH, Aardalen TR, Dilles T, Pharmaceutical Care in Primary Healthcare-A Study of Nurses', Pharmacists', and Physicians' Experiences of Interprofessional Collaboration. Healthcare (Basel). 2024;12(11):1100. https://doi.org/10.3390/healthcare12111100
21. Mustaqimah M, Saputri R. Review: Faktor Tidak Patuh Minum Obat Pada Pasien Diabetes Melitus. J Farm Syifa. 2023;1(1):7-12. https://doi.org/10.63004/jfs.v1i1.111
22. Insani WN, Lestari K, Abdulah R, Ghassani SK. Pengaruh Pelayanan Informasi Obat terhadap Keberhasilan Terapi Pasien Diabetes Melitus Tipe 2. J Farm Klin Indones. 2013;2(4):127-135.
23. Goenarso R, Anastasya P. Peningkatan Pemahaman Pasien Diabetes Mellitus Tipe 2 Terhadap Obat Anti Diabetes Oral Di Klinik Penyakit Dalam Rumah Sakit Adi Husada Kapasari Surabaya. Adi Husada Nurs J. 2015;1(2):41. https://doi.org/10.37036/ahnj.v1i2.21
24. Prasetya SA, Irawan A, Rahman S. Hubungan Motivasi Terhadap Kepatuhan Pengobatan Pada Penderita Diabetes Melitus Tipe II. J Nurs Invent. 2023;4(1):15-24. https://doi.org/10.33859/jni.v4i1.294

25. Fatiha CN, Sabiti FB. Peningkatan Kepatuhan Minum Obat Melalui Konseling Apoteker pada Pasien Diabetes Mellitus Tipe 2 di Puskesmas Halmahera Kota Semarang. JPSCR J Pharm Sci Clin Res. 2021;6(1):41. https://doi.org/10.20961/jpscr.v6i1.39297
26. Liu Z, Sang X, Liu Y, Yu C, Wan H. Effect of psychological intervention on glycemic control in middle-aged and elderly patients with type 2 diabetes mellitus: A systematic review and meta-analysis. Prim Care Diabetes. 2024;18(6):574-581. https://doi.org/10.1016/j.pcd.2024.09.006
27. Mphasha MH, Mothiba TM, Skaal L. Family support in the management of diabetes patients' perspectives from Limpopo province in South Africa. BMC Public Health. 2022;22(1):1-8. https://doi.org/10.1186/s12889-022-14903-1
28. Baig AA, Benitez A, Quinn MT, Burnet DL. Family interventions to improve diabetes outcomes for adults. Ann N Y Acad Sci. 2016;1353(1):89-112. https://doi.org/10.1111/nyas.12844
29. Puspita IEA, Wibowo IMP, Kristianto FC. Implementasi Pelayanan Telefarmasi di Apotek Sesuai Standar Pelayanan Kefarmasian. MPI (Media Pharm Indones). 2022;4(2):105-113. https://doi.org/10.24123/mpi.v4i2.5278
30. Hirsch JD, Bounthavong M, Arjmand A, Hincapie AL, Ramjan S, Nisperos M, et al. Improved patient-reported medication adherence, patient satisfaction, and glycemic control in a collaborative care pharmacist-led diabetes 'tune-up' clinic. Int J Environ Res Public Health. 2021;18(17):1-10. https://doi.org/10.3390/ijerph18179242
31. Sinuraya RK, Oktrina A, Handayani NK, Destiani DP, Puspitasari IM. Pelayanan Farmasi Klinis Meningkatkan Kontrol Gula Darah Pasien Diabetes Melitus. Indones J Clin Pharm. 2019;8(4):271. https://doi.org/10.15416/ijcp.2019.8.4.271
32. Rofiq A, Boy E, Wilan R, Sari P, Ayu DD, Koto U. Edukasi Diabetes Mellitus pada Keluarga Binaan Keluarga Fakultas Kedokteran UMSU dimasa Pandemi COVID-19. J Implementa Husada. 2022;3(2):90-93. https://doi.org/10.30596/jih.v3i2.11274
33. Jordan OJ, Benitez A, Burnet DL, Quinn MT, Baig AA. The Role of Family in Diabetes Management for Mexican American Adults. Hisp Heal Care Int. 2024;22(2):109-118. https://doi.org/10.1177/15404153231206086
34. Bakhtiar HS. Dikotomi Eksistensi Telemedicine Bagi Masyarakat Terpencil: Perspektif Teori Kemanfaatan. J Paradigma. 2022;3(2):115-125. https://doi.org/10.22146/jpmmpi.v3i2.79461
35. Sarabi RE, Sadoughi F, Orak RJ, Bahaadinbeigy K. The effectiveness of mobile phone text messaging in improving medication adherence for patients with chronic diseases: A systematic review. Iran Red Crescent Med J. 2016;18(5). https://doi.org/10.5812/ircmj.25183
36. Trianggraini SA, Wahyuni S, Tuah UH, Artikel H. Kolaborasi Inovasi Pelayanan Kesehatan Melalui Mobile JKN. 2024;9:9-17. https://doi.org/10.71040/irpia.v9i9.251
37. Sagala RB, Hajad V. Inovasi Pelayanan Kesehatan Mobile JKN Di Kantor BPJS Kota Subulussalam. J Soc Polit Gov. 2022;4(1):14-23. https://doi.org/10.24076/JSPG.2022v4i1.775

Supplements

Semi-structured interview guide

1. *Mengelola Efek Samping Obat*
   a. *Apakah bapak/ibu apoteker pernah mendapatkan keluhan pasien tentang efek samping obat Diabetes Melitus?*
   b. *Bagaimana cara bapak/ibu mengelola/mengatasi keluhan pasien tentang efek samping obat Diabetes Melitus?*
2. *Ketidakpatuhan Minum Obat*
   a. *Menurut bapak/ibu apoteker, apa hal paling utama yang menyebabkan pasien tidak patuh dalam minum obat? Jika ya bisa ceritakan?*
   b. *Apakah bapak/ibu apoteker memiliki solusi untuk mengatasi ketidakpatuhan dalam minum obat? Bisa mohon untuk diceritakan?*
3. *Kontrol Bulanan*
   a. *Menurut bapak/ibu apoteker, apakah pasien mengalami hambatan dalam pergi pemeriksaan rutin? Jika ya apakah bapak/ibu bisa menceritakan apa saja hambatan?*
   b. *Apakah bapak/ibu apoteker memiliki solusi untuk mengatasi hambatan dalam pergi kontrol? Bisa mohon untuk diceritakan dan bagaimana solusinya?*

English translation

1. Managing Medication Side Effects
   a. Can you share your experiences in receiving patient complaints about the side effects of Diabetes Mellitus medication? If yes, what kind of complaints do you usually receive? If not, why do you think patients have not reported any?
   b. How do you manage/overcome patient complaints about the side effects of Diabetes Mellitus medication?
2. Non-Compliance with Medication
   a. According to you as a pharmacist, what is the main thing that causes patients to be non-compliant when taking medicine? If so, can you tell me about it?
   b. Do you as a pharmacist have solutions to overcome non-compliance in taking medicine? Could you please tell me about them?
3. Monthly medical check-up.
   a. According to you as a pharmacist, do patients experience obstacles in going to routine checkups? If so, can you tell us what the obstacles are?
   b. Do you as a pharmacist have a solution to overcome the obstacles in going for control visits? Could you please tell me how the solution?