

Determinants of barriers to the implementation of the chronic disease management program (PROLANIS) among patients with diabetes mellitus in Indonesia: A systematic literature review

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ABSTRACT

The Chronic Disease Management Program (PROLANIS) is a proactive healthcare service system developed by BPJS Kesehatan to manage chronic diseases, including diabetes mellitus (DM). Although the program has been implemented since 2014, its achievement remains far below optimal, with various barriers reported across different regions of Indonesia. This Systematic Literature Review aims to identify and synthesize the determinants of barriers to PROLANIS implementation among patients with diabetes mellitus in Indonesia. A literature search was conducted across PubMed, Scopus, and Google Scholar databases, covering the period 2021–2026. A total of 78 articles were identified, and following the PRISMA 2020 screening process, 22 studies met the inclusion criteria. Quality assessment was performed using the JBI Critical Appraisal Checklist. The results is barriers were identified across four principal dimensions: (a) the patient dimension, encompassing low knowledge levels, insufficient motivation, economic constraints, and distance to healthcare facilities; (b) the healthcare provider and primary care facility (FKTP) dimension, comprising limited human resources and inadequate infrastructure; (c) the BPJS system dimension, including frequently changing regulations and financing limitations; and (d) the environmental dimension, involving social support and cultural factors. The conclusion is barriers to PROLANIS DM implementation are multidimensional in nature. Comprehensive interventions targeting patient, provider, system, and environmental factors are required to improve program outcomes.

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INTRODUCTION

Diabetes mellitus (DM) is one of the most critical non-communicable disease challenges of the twenty-first century. According to the International Diabetes Federation, an estimated 537 million adults worldwide were living with DM in 2021, a figure projected to rise to 783 million by 2045 (IDF, 2021). Indonesia ranks fifth globally in DM prevalence, with 19.5 million affected individuals in 2021 and a projected increase to 28.6 million by 2045 (Tarigan et al., 2024). National epidemiological data from the Indonesian Basic Health Research (Riskesdas) reported a prevalence of 2.0% among adults aged ≥ 15 years, with markedly higher rates in urban compared to rural settings (RI, 2018). These figures underscore the scale of the DM burden confronting Indonesia's health system and have driven increased investments in primary-care-based chronic disease management strategies (Prabowo et al., 2023)(Azmiardi et al., 2023)(Tarigan et al., 2024).

The clinical consequences of poorly controlled DM are multifaceted and severe. Chronic hyperglycemia drives progressive microvascular and macrovascular complications—including diabetic retinopathy, nephropathy, peripheral neuropathy, and cardiovascular disease—substantially reducing health-related quality of life and increasing premature mortality (Ritonga et al., 2025)(Amelia et al., 2021). Psychosocial comorbidities, particularly depression, are also disproportionately prevalent among DM patients and further compromise self-management capacity (Azmiardi et al., 2023). Collectively, these complications impose enormous direct and indirect economic costs on the Indonesian National Health Insurance (Jaminan Kesehatan Nasional/JKN) system managed by BPJS Kesehatan, with DM consistently representing one of the highest-expenditure conditions within the JKN portfolio (Mulyanto et al., 2023)(Wulandari et al., 2025)(Rinda et al., 2025).

In response to the growing DM burden, BPJS Kesehatan established the Chronic Disease Management Program (Program Pengelolaan Penyakit Kronis/PROLANIS) in 2014 as a proactive, structured service system targeting JKN participants with T2DM and hypertension at Primary Healthcare Facilities (Fasilitas Kesehatan Tingkat Pertama/FKTP) (Kesehatan, 2014). PROLANIS encompasses a comprehensive service package, including regular medical consultations, health education sessions, appointment reminders, home visits, health status monitoring, and participant club activities, with an overarching target of achieving at least 75% of enrolled participants maintaining optimal clinical control (Krisnadewi et al., 2025)(Rokhmad & Supriyanto, 2023). The program represents Indonesia's primary policy instrument for translating chronic disease management from hospital-based to primary care settings (Putri et al., 2020)(Mulyanto et al., 2023).

Despite over a decade of implementation, PROLANIS program achievements for DM participants remain substantially below national targets. Multiple studies document persistently low participation rates, high dropout, and inadequate clinical outcomes across most Indonesian provinces (Sari & Nurhayati, 2023)(Dewi et al., 2022)(Wahyuni & Andini, 2024)(Krisnadewi et al., 2025). At the patient level, barriers include insufficient health literacy, low self-efficacy, medication non-adherence, and a fatalistic illness perception (Sidiq et al., 2021)(Sayuti et al., 2024) (Wulandari et al., 2025)(Akbar et al., 2025). Self-management behaviors physical activity, dietary adherence, and blood glucose monitoring remain suboptimal and are strongly influenced by personal motivation, family dynamics, and community norms (Rofi'i et al., 2022) (Ulfah et al., 2022)(Munir et al., 2025)(Widiyanto et al., 2023).

Healthcare provider and FKTP-level barriers include chronic shortages of qualified personnel, absence of dedicated dietitians, inadequate diagnostic equipment, and insufficient PROLANIS-specific professional training (Putri et al., 2020)(Dewi et al., 2022)(Krisnadewi et al., 2025). At the system level, frequent BPJS regulatory changes, inadequate dissemination, and capitation funding insufficient to cover all PROLANIS components have undermined program continuity (Dewi et al., 2022)(Rinda et al., 2025)(Mulyanto et al., 2023). Environmental and geographical barriers, including limited family support, cultural health beliefs conflicting with medical recommendations, reliance on traditional medicine, and physical remoteness, compound

participation deficits particularly in rural, island, and mountainous areas (Ulfah et al., 2022) (Zainuddin et al., 2023) (Pasambo et al., 2025) (Pasambo et al., 2026). The role of media and public discourse in shaping DM health behavior has further emerged as an underutilized domain for health promotion within PROLANIS (Santyarini & Susanto, 2024).

Despite this growing body of individual studies, a comprehensive, methodologically rigorous synthesis of the determinants of barriers to PROLANIS DM implementation across Indonesia is lacking. Existing research is geographically fragmented and methodologically heterogeneous, preventing the formation of a coherent national picture. This Systematic Literature Review (SLR), conducted in strict accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021) (Liberati et al., 2009), aims to identify, critically appraise, and synthesize available evidence on the determinants of barriers to PROLANIS DM implementation in Indonesia, as a scientific foundation for targeted, multi-level policy reform. Disease perception—defined as patients' cognitive and emotional representations of their illness, including perceived identity, timeline, consequences, and controllability—has emerged as a particularly salient determinant of PROLANIS engagement. Patients who perceive DM as an uncontrollable or inevitable condition consistently demonstrate lower motivation to participate in structured management programs (Sidiq et al., 2021; Akbar et al., 2025). Negative illness perceptions, such as fatalistic beliefs and low perceived treatment efficacy, reduce self-management adherence and FKTP attendance rates, underscoring the need for targeted illness perception modification interventions within PROLANIS.

RESEARCH METHOD

Study Design

This study employed a Systematic Literature Review (SLR) design, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Page et al., 2021) (Liberati et al., 2009). The research protocol was prospectively developed prior to implementation to minimize selection and reporting bias.

PICO(S) Framework

The research question was formulated using the PICO(S) framework: (P) Type 2 DM patients enrolled in PROLANIS or PROLANIS administrators at Indonesian FKTP; (I) Implementation of the PROLANIS program at primary care level; (C) Not applicable; (O) Barriers across the patient, provider, system, and environmental dimensions; (S) Cross-sectional, cohort, qualitative, and mixed-methods designs.

Search Strategy

A literature search was conducted across three primary databases—PubMed, Scopus, and ScienceDirect—covering publications from January 2021 to March 2026. Search strings were constructed using conceptual blocks encompassing PROLANIS, diabetes mellitus, barriers/obstacles, and the Indonesian context. Search string: ("PROLANIS" OR "chronic disease management program") AND ("diabetes mellitus" OR "type 2 diabetes") AND ("barrier" OR "determinant" OR "kendala" OR "obstacle") AND ("Indonesia" OR "Puskesmas" OR "primary health care"). The 2021–2026 publication range was deliberately selected for two principal reasons. First, 2021 marks the year of the IDF Diabetes Atlas 10th Edition, which provided updated global and national DM burden estimates, representing a natural starting point for contemporary evidence synthesis. Second, this period encompasses the post-COVID-19 transition in primary healthcare delivery in Indonesia, during which PROLANIS implementation encountered new structural and operational challenges. Restricting the search to this five-year window ensures that findings reflect the current program context rather than earlier configurations of BPJS regulations and FKTP capacity, thereby maximizing relevance for ongoing policy reform efforts.

Inclusion and Exclusion Criteria

Studies were included if they: (1) involved DM patients enrolled in PROLANIS or PROLANIS administrators at Indonesian FKTP; (2) reported barriers or obstacles to PROLANIS DM implementation; (3) were conducted in Indonesia between 2021 and 2026; and (4) were published in English or Indonesian peer-reviewed journals. Studies were excluded if they: did not relate to BPJS Kesehatan's PROLANIS program; addressed hypertension PROLANIS only; were conducted outside Indonesia; were themselves literature reviews; or failed methodological quality criteria.

Study Selection and Data Extraction

Screening proceeded in two stages – title/abstract screening followed by full-text review – conducted by two independent reviewers using Covidence software. Discrepancies were resolved through structured discussion. Data extraction encompassed: publication details, study design, setting, sample characteristics, identified barriers within each dimension, and study recommendations. Quality appraisal was performed using the JBI Critical Appraisal Checklist appropriate to each design.

Selection Process (PRISMA 2020)

Figure 1 presents the PRISMA 2020 flow diagram. A total of 78 articles were identified across three databases (PubMed: 3, Scopus: 69, ScienceDirect: 6). One duplicate was removed using Covidence software, yielding 77 articles for title and abstract screening. Eighteen articles were excluded at this stage, leaving 59 articles assessed for eligibility through full-text review. Thirty-seven articles were subsequently excluded (incorrect outcome: 13; incorrect program indication: 24). Ultimately, 22 studies met the inclusion criteria and were incorporated into the review.

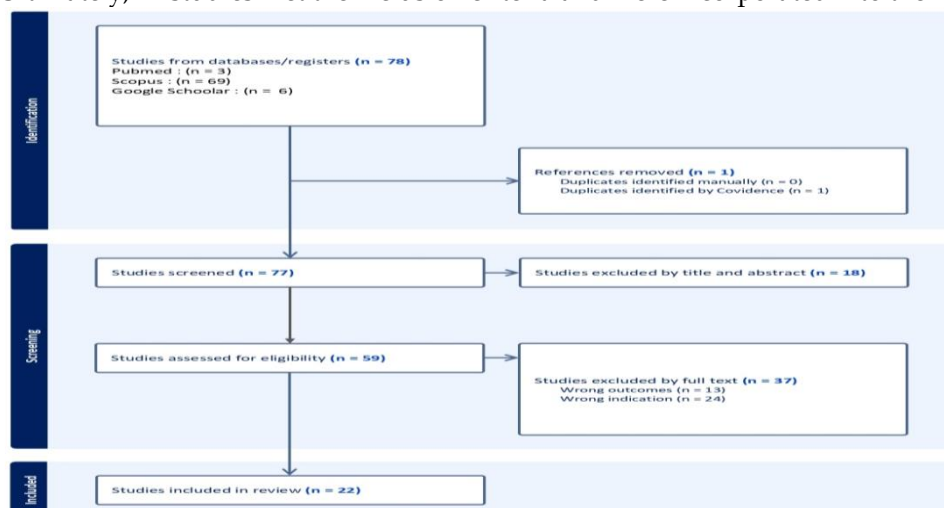


Figure 1. PRISMA determinants of barriers to PROLANIS implementation among patients with diabetes mellitus in Indonesia: a systematic literature review

RESULTS AND DISCUSSIONS

Characteristics of Included Studies

Twenty-two studies met the inclusion criteria, comprising 16 quantitative (cross-sectional), 4 qualitative (phenomenological and case study designs), and 2 mixed-methods studies. The studies were distributed across multiple Indonesian provinces, with the greatest concentration in Central Java (n=7), West Java (n=5), and East Java (n=4). Publication years ranged from 2021 to 2025. Sample sizes in quantitative studies ranged from 45 to 312 respondents. All studies were conducted at FKTP (Puskesmas and/or primary clinics) affiliated with BPJS Kesehatan. The

heterogeneity of study designs and geographic coverage reflects the varied contexts in which PROLANIS operates across Indonesia, and underscores the importance of synthesizing evidence across settings.

Patient Dimension

- a. Sociodemographic Factors, low educational attainment was consistently identified as a barrier to PROLANIS DM participation, reported in 14 of 22 included studies (63.6%). Participants with less than senior secondary education were 2.1 to 3.8 times more likely to be inactive in PROLANIS (OR: 2.1–3.8; $p < 0.05$) (Sari & Nurhayati, 2023) (Azmiardi et al., 2023) (Mulyanto et al., 2023) (Pasambo et al., 2025). Advanced age (>60 years) was associated with reduced mobility and physical limitations affecting FKTP attendance (Akbar et al., 2025) (Prabowo et al., 2023) (Tarigan et al., 2024) (Sidiq et al., 2021). Gender and employment status interacted with educational barriers: working-age employed adults frequently reported scheduling conflicts as a primary reason for non-attendance, particularly in urban settings (Ulfah et al., 2022) (Tarigan et al., 2024).
- b. Knowledge and Attitudes, insufficient knowledge regarding DM pathophysiology, potential complications, and the benefits of PROLANIS participation was documented in 17 studies (77.3%) (Dewi et al., 2022) (Krisnadewi et al., 2025) (Rokhmad & Supriyanto, 2023) (Sayuti et al., 2024) (Sidiq et al., 2021). Inadequate comprehension of DM complications—such as retinopathy, nephropathy, and cardiovascular risk—and of the value of regular follow-up contributed to non-attendance. Structured educational interventions demonstrated significant improvements in both knowledge scores and self-efficacy (Sayuti et al., 2024) (Zainuddin et al., 2023), supporting the integration of tailored health literacy programming into PROLANIS. A fatalistic attitude toward chronic illness, wherein patients perceived DM as an inevitable consequence of aging or divine will rather than a manageable condition, was also reported (Dewi et al., 2022) (Rokhmad & Supriyanto, 2023). This cognition closely aligns with low perceived susceptibility and perceived benefits constructs of the Health Belief Model (HBM), which emerged as the predominant theoretical framework across included studies. Media portrayal of DM in Indonesian public discourse has been identified as reinforcing stigma and misconceptions, further complicating patient engagement with formal health programs (Santyarini & Susanto, 2024).
- c. Motivation, Self-Efficacy, and Illness Perception, low intrinsic motivation for DM self-management and the perception that PROLANIS participation confers no tangible health benefit were reported in 13 studies (59.1%). Employing the Health Belief Model framework, low perceived severity of DM complications, combined with high perceived barriers to program participation, reliably predicted non-adherence (Akbar et al., 2025) (Munir et al., 2025) (Sidiq et al., 2021) (Wulandari et al., 2025). National survey data confirm that medication adherence to glucose-lowering agents remains poor across Indonesian DM patients (Wulandari et al., 2025), a pattern that PROLANIS monitoring activities are specifically designed to address. Self-empowerment interventions that strengthen internal locus of control and illness coherence, combined with family support, have shown promising associations with improved quality of life outcomes and program retention (Munir et al., 2025) (Ulfah et al., 2022).
- d. Economic Factors and Geographical Access, transportation costs to FKTP, indirect costs related to loss of daily income, and residential distance exceeding 5 km were documented as significant barriers in 11 studies (50%) (Mulyanto et al., 2023) (Pasambo et al., 2025) (Pasambo et al., 2026) (Putri et al., 2020) (Ritonga et al., 2025). Socioeconomic disparities were particularly pronounced: low-income patients in rural and island-based regions reported both financial and geographical constraints as compounding barriers, whereas urban patients were more constrained by time and competing work responsibilities (Pasambo et al., 2025) (Mulyanto et al., 2023). Poor drug compliance driven by economic hardship further undermined glycemic

control, independent of PROLANIS attendance (Pasambo et al., 2025)(Pasambo et al., 2026)(Wulandari et al., 2025).

Healthcare Provider and FKTP Dimension

Limitations in human resources at FKTP emerged as the most pervasive provider-level barrier, reported in 18 of 22 studies (81.8%). The unavailability of full-time general practitioners, the absence of nutritionists or dietitians dedicated to DM care, and excessive nursing workloads adversely affected the quality, continuity, and scheduling consistency of PROLANIS services (Dewi et al., 2022)(Krisnadewi et al., 2025)(Mulyanto et al., 2023)(Rokhmad & Supriyanto, 2023). Insufficient PROLANIS DM-specific training for healthcare workers was also reported in 10 studies (45.5%), resulting in variable implementation fidelity across FKTP(Krisnadewi et al., 2025)(Putri et al., 2020)(Rinda et al., 2025). Inadequate diagnostic equipment, including glucometers, HbA1c analyzers, and foot-examination kits, constituted an infrastructural barrier in 9 studies (40.9%), directly limiting the comprehensiveness of monitoring activities (Dewi et al., 2022)(Putri et al., 2020)(Rinda et al., 2025). Inconsistent and poorly communicated PROLANIS scheduling further reduced predictability and trust among participants(Krisnadewi et al., 2025)(Rokhmad & Supriyanto, 2023). Qualitative data indicate that patients who experienced respectful, individualized provider interactions demonstrated significantly higher program retention, highlighting interpersonal quality of care as an underappreciated dimension of PROLANIS success (Dewi et al., 2022)(Krisnadewi et al., 2025). Evidence on the potential of physical exercise interventions, such as low-to-moderate aerobic exercise, to complement pharmacological management within PROLANIS further supports expanding provider competencies beyond medication management(Widiyanto et al., 2023)(Amelia et al., 2021)(Rofi'i et al., 2022).

BPJS System and Regulatory Dimension

Frequent changes to BPJS Kesehatan regulations and policies, which were inadequately disseminated to FKTP administrators and participants, were the most prominent systemic barrier, identified in 15 studies (68.2%). This regulatory volatility created confusion regarding eligibility criteria, program components, and reporting requirements among both providers and patients (Dewi et al., 2022)(Krisnadewi et al., 2025)(Rinda et al., 2025). Insufficient capitation funding to cover all PROLANIS components—particularly health education activities, home visits, and monitoring consumables—was reported in 12 studies (54.5%), forcing FKTP administrators to prioritize basic clinical services at the expense of preventive PROLANIS activities (Dewi et al., 2022)(Mulyanto et al., 2023)(Rinda et al., 2025). Demonstrated significant inequalities in PROLANIS quality and outcomes that tracked along urban-rural and socioeconomic gradients, attributable in part to differential capitation allocations and resource availability(Mulyanto et al., 2023). The P-CARE electronic health information system, intended to streamline PROLANIS data recording and performance monitoring, was reported as technically unreliable and administratively burdensome in multiple FKTP settings, undermining clinical decision-support utility (Krisnadewi et al., 2025)(Rinda et al., 2025). Comparisons with comparable chronic disease management programs in regional middle-income countries suggest that stable, long-term financing commitments and clearly defined accountability structures are prerequisites for sustained program performance (Mulyanto et al., 2023)(Putri et al., 2020).

Environmental Dimension

Limited family and social support, cultural norms conflicting with medical recommendations, and reliance on traditional or herbal medicine were reported as environmental barriers in 10 studies (45.5%). Family members play a dual role in PROLANIS participation: strong family support was positively associated with attendance and adherence to self-management, while family-level opposition or indifference exacerbated non-participation (Ulfah et al., 2022)(Munir et al., 2025). Cultural dietary prohibitions and the social expectation of consuming certain foods at communal events frequently contradict medical dietary advice, constituting an

underrecognized barrier at the community level (Rofi'i et al., 2022)(Dewi et al., 2022). Demonstrated that community-based health literacy interventions, such as structured walking exercise programs with integrated education, can improve clinical outcomes, underscoring the potential of community-level environmental interventions (Zainuddin et al., 2023). Geographical isolation, particularly in island, mountainous, and remote areas, amplified both the practical barriers to FKTP attendance and the informational barriers resulting from limited health outreach (Pasambo et al., 2025)(Mulyanto et al., 2023)(Amelia et al., 2021).

Cross-Dimensional Synthesis and Policy Implications

The findings of this review, analyzed through a socio-ecological framework, confirm that barriers to PROLANIS DM implementation are fundamentally multidimensional, multilevel, and mutually reinforcing. Single-factor interventions targeting only patient knowledge or only provider capacity are inherently insufficient. A patient with adequate DM knowledge who faces prohibitive transportation costs or fragmented FKTP scheduling will remain non-adherent; conversely, a well-resourced FKTP serving a population with deep cultural resistance to biomedical recommendations will achieve limited health impact. The strongest evidence points to five interconnected domains requiring simultaneous policy attention.

The interrelationship between patient barriers, healthcare facility capacity, and the BPJS system operates through a cascade of interdependencies that collectively determine PROLANIS success. At the patient level, low health literacy and fatalistic illness perceptions reduce the demand for program participation; however, these individual-level factors are substantially amplified or mitigated by provider-level determinants. When FKTP providers lack sufficient training, time, or diagnostic resources, the quality of patient education deteriorates, reinforcing patient-level knowledge deficits and eroding trust in the program. These provider limitations are in turn structurally conditioned by the BPJS system: inadequate capitation funding prevents FKTP administrators from hiring additional staff or procuring necessary equipment, while frequent regulatory changes undermine the consistency of service delivery. Consequently, a patient who might otherwise overcome motivational barriers encounters a fragmented service environment that further discourages engagement. This cascade means that improvements at any single level—such as patient education campaigns alone, or provider training without accompanying resource allocation—will yield suboptimal results unless addressed as part of a coherent, multi-level intervention strategy (Mulyanto et al., 2023; Krisnadewi et al., 2025; Dewi et al., 2022).

First, patient-level health literacy must be strengthened through culturally adapted, multi-media DM education that extends beyond clinical encounters into community settings (Sayuti et al., 2024)(Zainuddin et al., 2023)(Santyarini & Susanto, 2024). Second, FKTP human resource and competency gaps must be systematically addressed through dedicated PROLANIS training, rational staffing standards, and supervised exercise programming (Widiyanto et al., 2023)(Krisnadewi et al., 2025)(Dewi et al., 2022). Third, BPJS Kesehatan must stabilize regulatory requirements, simplify reporting through an upgraded P-CARE system, and adjust capitation formulas to adequately fund the full PROLANIS component set, with equity-weighted allocations for rural and remote FKTP (Mulyanto et al., 2023)(Rinda et al., 2025). Fourth, family and community engagement strategies—including structured caregiver education modules and PROLANIS participant clubs serving as social support networks—are required to address the environmental dimension (Munir et al., 2025)(Ulfah et al., 2022)(Rofi'i et al., 2022). Fifth, targeted interventions must address socioeconomic barriers through transportation subsidies, flexible scheduling, and telemedicine extensions for geographically remote populations, recognizing the disproportionate burden borne by lower-income rural patients (Pasambo et al., 2025)(Pasambo et al., 2026)(Akbar et al., 2025).

CONCLUSION

This Systematic Literature Review identified that the determinants of barriers to PROLANIS DM implementation in Indonesia encompass four principal dimensions: (a) the patient dimension—low knowledge, insufficient motivation, poor self-efficacy, economic barriers, and geographical inaccessibility; (b) the healthcare provider and FKTP dimension—limited human resources, competency gaps, and inadequate diagnostic infrastructure; (c) the BPJS system dimension—regulatory instability, insufficient and inequitably distributed capitation financing, and unreliable information systems; and (d) the environmental dimension—limited family and social support, cultural barriers, and geographical remoteness.

Policy implications include: (1) development of standardized, culturally responsive PROLANIS DM educational modules deployable through community channels; (2) increased and equity-weighted capitation allocation for PROLANIS health promotion and preventive activities; (3) regulatory stabilization and timely, systematic dissemination of BPJS policy changes; (4) comprehensive upgrade and simplification of the P-CARE information system; and (5) expansion of family- and community-level engagement strategies. Future research should prioritize intervention studies—including controlled trials and implementation science designs—to evaluate the effectiveness of multi-level strategies specifically designed to address identified PROLANIS barriers in diverse Indonesian settings. These findings carry several broader implications for chronic disease management policy development in Indonesia. Most fundamentally, they demonstrate that PROLANIS cannot be optimized through narrow, single-sector reforms; effective policy must simultaneously address patient, provider, system, and environmental dimensions. For national policymakers at the Ministry of Health and BPJS Kesehatan, this review provides an evidence base for restructuring PROLANIS funding formulas to include equity weights for underserved populations and for establishing minimum FKTP staffing and equipment standards as preconditions for PROLANIS accreditation. At the provincial and district levels, findings support the development of context-sensitive implementation guides that account for the specific geographical, cultural, and socioeconomic barriers documented across Indonesian regions. More broadly, the multidimensional barrier profile identified in this review aligns with international evidence on chronic disease management in middle-income countries, suggesting that Indonesia's PROLANIS experience may offer transferable lessons for primary care chronic disease program reform across comparable health systems in Southeast Asia.

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