Journal of Applied Pharmaceutical Science Vol. 15(01), pp 153-161, January, 2025
Available online at http://www.japsonline.com
DOI: 10.7324/JAPS.2024.194416
ISSN 2231-3354

Implementation preventive program for diabetic mellitus (PROLANIS) at Community Health Center in Indonesia: A qualitative study

Kadek Ida Krisnadewi[1,2], Susi Ari Kristina[3*], Tri Murti Andayani[4], Dwi Endarti[3]

[1]Doctoral Program in Phramaceutical Science, Faculty Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia.
[2]Departement of Pharmacy, Faculty of Scienceand Technology, Universitas Bali Dwipa, Bali, Indonesia.
[3]Departement Pharmaceutics, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia.
[4]Departement of Pharmacology and Clinical Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia.

ARTICLE HISTORY

Received on: 15/07/2024
Accepted on: 19/10/2024
Available Online: 25/11/2024

Key words:
Prevention, implementation, community health Center, diabetic mellitus, Indonesia.

ABSTRACT

Chronic diseases pose a significant challenge for elderly communities, with diabetes mellitus demanding particular attention. To address this, Indonesia's Universal Health Coverage Program, commonly known as BPJS (Badan Penyelenggara Jaminan Sosial), established PROLANIS (Program untuk Lansia dan Penyakit Kronis). This program caters specifically to the elderly, offering comprehensive support through medical consultations, group education sessions, physical activities, SMS reminders, home visits, and regular health monitoring. However, PROLANIS implementation varies across regions. Geographical factors, access to facilities, stakeholder perspectives, and healthcare worker input all influence how the program is delivered. This research aims to identify the implementation of PROLANIS activities in five diverse regions in Indonesia. Utilizing a qualitative approach, the research employs in-depth interviews as its primary data collection method. The Consolidated Framework for Implementation Research (CFIR) guides the study, focusing on both intervention characteristics and the implementation process itself. PROLANIS services are integrated within existing healthcare structures at the village/sub-district level, seamlessly blending with other services available to the elderly population. Planning and execution of general activities adhere to national operational standards, ensuring consistency across regions. Physical exercise sessions, for instance, occur routinely, at least every 2 weeks or once a month. Recognizing regional differences, the program allows for special adaptations to overcome challenges. These adaptations, often influenced by human resource limitations, local infrastructure, and logistical hurdles such as transportation or scheduling constraints, ensure program effectiveness despite varying contexts.

INTRODUCTION

Diabetes mellitus (DM) has skyrocketed since 1980, ballooning from 108 million to 537 million (8.5%) cases in 2021 alone [1–3]. This alarming trend is projected to continue, reaching 643 million by 2030 and a staggering 783 million by 2045 [4]. A chronic disease often affecting older adults and adults in general, diabetes comes in various forms. Notably, type 2 diabetes tends to strike individuals from lower-middle to upper-middle income classes [2,5–7]. Fortunately, type 2 patients can significantly improve their quality of life by adopting healthy habits like dietary changes, regular physical activity, and weight management. Studies have shown that comprehensive interventions, like those offered in diabetes prevention programs (DPPs), can effectively prevent diabetes in obese individuals [6–8]. Additionally, a systematic review revealed that more intensive interventions lead to better outcomes for existing diabetes patients, including improved

*Corresponding Author
Susi Ari Kristina, Departement Pharmaceutics, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia.
E-mail: susiari_k @ ugm.ac.id

quality of life, lower blood sugar levels, reduced body weight, and fewer complications [9].

While preventing diabetes can prevent future complications, expanding healthcare interventions toward prevention and control remains a challenge for Indonesia's Ministry of Health. The implemented Chronic Disease Prevention Program PROLANIS, offering medical consultations, educational groups, SMS reminders, home visits, and health monitoring for hypertension (HT) and diabetes patients, shows promise but suffers from low coverage [8]. Health programs in the form of interventions have a positive impact, but these services have low coverage. In research conducted by Assupina. et al. [10], regarding the evaluation of the PROLANIS program in Palembang City, it shows that program implementation is still less [10]. One of the problems revealed in this research is the failure to organize club activities due to a lack of energy and facilities. Research by Assupina *et.al.* [10] points to several obstacles: lacking energy and facilities hindering club activities, insufficient infrastructure and resources hampering program delivery, inconsistent management practices across healthcare settings, and varying participant engagement. Additionally, Sari [11] and Sitompul et al. [4] highlighted that geographical disparities, uneven distribution of facilities, and diverse viewpoints due to the unavailability of standard operating procedures (SOPs) among health workers and stakeholders further exacerbate implementation challenges, particularly in remote areas [11,4]. Other research has found that geographical factors, availability of health facilities, and perceptions of health workers and stakeholders are the causes of unsuccessful implementation due to differences in developed areas and underdeveloped areas [9].

While Community Health Centers, popularly known as Puskesmas, serve as the first point of medical care for many Indonesians, their role extends beyond initial consultations. One notable example is the PROLANIS program, specifically targeting elderly individuals with diabetes or HT who frequent these facilities. Recognizing the program's potential impact across diverse regions, this research delves into the nuances of its implementation across five Indonesian locations chosen based on the country's Universal Health Coverage regionalization. By examining real-world variations in practice, this study aims to illuminate the implementation landscape of PROLANIS and inform its future optimization.

METHODS

Study design

To gain a nuanced understanding of how the PROLANIS program unfolds in Indonesia, this research adopts a qualitative, semi-structured face-to-face design. By focusing on the insights of key stakeholders—directly involved health workers—the study delves into their perspectives on program implementation. Employing the Consolidated Framework for Implementation Research (CFIR), the research scrutinizes both the process and characteristics of the program, meticulously identifying factors that either bolster or hinder its execution across diverse contexts. This in-depth exploration aims to illuminate the realities of PROLANIS implementation and offer valuable insights for optimizing its effectiveness in reaching elderly patients throughout Indonesia [12].

Study location and participant recruitment

To fully understand the challenges and nuances of implementing the PROLANIS program across diverse Indonesian regions, this research delves into five UHC regionalizations chosen based on the INA-CBGs tariff structures, which account for regional variations in healthcare costs. This strategic selection ensures the study captures a wide range of implementation experiences and potential obstacles. Data were collected in five locations: Yogyakarta City (4 health centers), Denpasar City, Boalemo Regency (4 health centers), Palangkaraya City (4 health centers), and Kupang City (3 health centers). All participating informants were directly involved in PROLANIS activities and possessed a deep understanding of the regional implementation context. After thorough information disclosure, each informant willingly signed a consent form to join the study. This meticulous approach ensures robust data collection and comprehensive insights into the complexities of PROLANIS implementation across different Indonesian landscapes.

Data collection

This research leverages the CFIR to gain nuanced insight into the interplay between context and the implementation of the PROLANIS program across Indonesia. CFIR's ability to illuminate both supporting and inhibiting factors for program success makes it an ideal framework for this study [12]. The selection of CFIR domains is tailored to research objectives, as a systematic review has shown [13]. The data collection stage utilizes a comprehensive interview guide designed around two CFIR domains: intervention characteristics and the implementation process.

Delving into the intricacies of PROLANIS implementation at Indonesian community health centers (Puskesmas), this research draws upon the CFIR framework to analyze two key domains: intervention characteristics and implementation process. Through semi-structured interviews conducted in Indonesian, the study explores the program's inner workings, focusing on its core activities—medical consultations, group education, reminders, and home visits. The main questions were as follows for the first domain (intervention resources) were as follows: 1) How did the PROLANIS health program begin to become a routine program at the local health center?; 2) What is your perception regarding the benefits that PROLANIS participants will get from PROLANIS?; 3) How are program services carried out and adapted, Is there an adjustment to the situation and conditions at the local location?; 4) What are the difficulties faced when carrying out PROLANIS services?; 5) How and what funding is needed for the program and where do these costs come from? The main questions for the second domain (implementation process) were: 1) How were the initial program planning steps carried out? 2); What is the process for forming a task team for the program?; 3); How is the program implemented according to the SOP? Can you explain how each program is scheduled?; 4) What is your experience and personal perspective about the program? The individual face-to-face interviews

were conducted by the first and third authors (KIDK and DE) in Indonesian (the national language of Indonesia). Interviews took place at the Community Health Center (Puskesmas) after participants received health services for diabetes. Each interview lasted approximately 30 minutes on average.

Data analysis

This research followed a meticulous data analysis protocol to ensure accurate and accessible results. Interviews conducted in Indonesian were audio recorded and transcribed verbatim, serving as the foundation for analysis using the Miles and Huberman (1992) model. This three-stage model began with in-depth interviews and observations, capturing participant perspectives and contextual detail. Next, data reduction involved intensive review and condensation of transcripts, prioritizing themes and patterns within the two relevant CFIR domains: intervention characteristics and implementation processes [12]. To guarantee consistency, two researchers independently analyzed the transcripts and reached an agreement on coding before interpretation. Finally, drawing on the identified themes and patterns, the analysis culminated in the development of robust and reliable conclusions. This rigorous approach guarantees the trustworthiness and clarity of the research findings.

Ethics approval

The study protocol was approved by medical and health research ethics committee of faculty of medicine, public health and nursing, UNIVERSITAS GADJAH MADA, Indonesia (Approval number KE/FK/1652/EC/2022; Date: 26 DEC, 2022). Potential participants were thoroughly informed about the study through detailed information sheets, and their written consent was secured. As a token of appreciation, participants received souvenirs. Importantly, their consent extended to anonymous publication of their insights, and all personal identifiers were meticulously removed from the data to ensure complete anonymity. This commitment to ethical research practices safeguards participant privacy and fosters trust in the research process.

RESULTS

Nineteen health workers from diverse Indonesian regions (illustrated in Fig. 1) participated in this study, offering valuable insights into the PROLANIS program. The majority of participants fell within the 32-39 age range, and women were prominently represented. As Table 1 details, nurses formed the primary informant group, though doctors and even a pharmacist contributed perspectives from various community health centers. To glean a comprehensive understanding of their experiences, we analyzed the research findings through the lens of two key CFIR domains: intervention characteristics and implementation processes. This multifaceted approach aimed to illuminate the strengths, challenges, and nuances of PROLANIS implementation across diverse Indonesian contexts.

Intervention characteristic

Implementation discusses what is being implemented, and what is the type, core, and origin of the program being

Figure 1. Five regionalization of research.

implemented, as well as components that need to be adjusted [14–16]. 5 points are discussed in implementation characteristics including, intervention resources, relative advantage, adaptability, complexity, and cost. Intervention resources refer to an organization or group that develops programs and sponsors them, typically a credible and reputable organization [14]. Relative advantage refers to the advantage of the program implemented, while adaptability refers to the flexibility of the implemented program and the possibility to modify the program according to local resources, in this case, the local context. Complexity refers to a measure of the difficulty of implementing this program, either in terms of connections or coverage and cost as the financing point of a program [17,18].

Intervention resources

As part of the National Health Insurance Program (BPJS), the PROLANIS program, being implemented progressively since 2016, has adapted its approach in certain rural areas around Denpasar. These areas, where local communities traditionally organize through Banjar groups, benefit from PROLANIS activities both at the community health center and within their own communities, ensuring easier participation for older residents.

"...around 3,400 local residents here participated in the PROLANIS program's medical consultations and group education activities, organized by their community health center (Puskesmas). These activities are considered by BPJS in their evaluation of Puskesmas performance, which can ultimately influence UHC funding allocations to individual Puskesmas. This incentivizes Puskesmas to effectively engage residents in PROLANIS activities, aiming to improve health outcomes and optimize resource allocation within the UHC system..." (Denpasar, informant 4).

"...For a long time, people in Banjar have enjoyed participating in regular exercise through a local gathering. When the BPJS PROLANIS program arrived in 2016, we realized it could complement our existing activities. So, we reached out to PROLANIS and invited them to bring their resources and activities to our community..." (Yogyakarta, informant 5).

Relative advantage

The PROLANIS program's focus on pain management in chronic diseases like diabetes is seen as beneficial for both patients and community health centers (Puskesmas). Patients not only gain better awareness of their pain and effective management strategies, but also develop a deeper understanding of the importance of medication adherence, leading to improved pain control. For Puskesmas, this translates into improved performance by helping them achieve their target blood sugar level goals set by Badan Penyelenggara Jaminan Sosial (BPJS), demonstrating successful disease management within the community.

"....the PROLANIS participants are eager to stay active, even if their legs sometimes falter. They enthusiastically participate in gymnastics, and their supportive WhatsApp group allows them to ask questions, share their experiences with managing their conditions, increasing compliance taking medicine by counseling pharmacy and exchange health tips. Their knowledge about healthcare extends beyond hypertension and diabetes; they quickly grasp new information on various health topics and confidently differentiate between different medications. ..." (Kupang, informant 10).

Adaptation

One region cleverly adapted the PROLANIS program by integrating it with their established Posyandu village outreach services. This means that PROLANIS activities such as physical exercises and educational sessions are now conducted directly within the villages, eliminating the need for elderly residents to travel to the community health center. This innovative approach not only eases participation for older individuals but also fosters a more inclusive environment and strengthens community engagement in health initiatives.

"...As an adaptation, we combine PROLANIS activities like physical exercises and educational sessions with regular monthly health checks in the villages. These combined sessions, conducted together with Puskesmas staff (Pusling)..." (Boalemo, informant 13)

Complexity

Puskesmas faces challenges in implementing PROLANIS due to shortages of medicines and limited human resources. This can lead to delays in services, reduced activity frequency, or limitations in reaching all participants. The funding for PROLANIS activities comes from BPJS through monthly claims.

"...One recurring issue, both this year and in previous years, has been access to prescribed medications. Sometimes, when I receive a new prescription, the medication might be out of stock at the pharmacy. In these situations, I may resort to skipping the dose or even trying to find a substitute, which raises concerns about medication adherence and potential health risks. Another problem I encountered involved a referral I received. I was referred to a specialist for further evaluation, but the referral number turned out to be incompatible with the PROLANIS program, causing confusion and delays. To address these challenges, it would be helpful to have clearer distinctions in referral channels and medication stock management systems for both PRB and PROLANIS patients. This would ensure smoother access to needed healthcare services and avoid unnecessary complications...." (Boalemo, informant 13).

*"…. Yes, we're facing human resource challenges due to ongoing staff shortages. This makes it difficult for us to hold regular PROLANIS educational sessions..." (*Palangka Raya, Informant 16).

Cost

The claim for financing the activity program is carried out for one activity per group, which consists of the costs of educational speakers, exercise instructors, and food. Medical and laboratory costs are costs incurred based on BPJS treatment claims.

"....For a group of 30 participants, the individual activity program costs per session are as follows: Rp. 500,000 for the educational speaker's honorarium, Rp. 300,000 for the gymnastics instructor, and Rp. 390,000 for light refreshments.

Additionally, each group claims Rp. 15,000 per month through BPJS for medication refills and specific lab checks under the program's capitation arrangement. This arrangement covers medicine, while individual lab check costs are factored into the total based on actual usage..." (Boalemo, informant 14).

Implementation process

The implementation process explains how health workers act in delivering activity programs. The implementation process consists of planning, engaging, executing, reflecting, and evaluating. Planning refers to the steps to implement the program developed, looking at the description of the initial plan to start implementing PROLANIS. Engaging refers to a participation process involving officials and activity participants. Informants are asked to describe efforts to involve health workers and participants. Execution refers to the stages of implementing activities, steps, schedules, and things that need to be considered during the activity. Reflection and evaluation refer to the facilitator's perceptions of the implementation of activities.

Planning

The planning was carried out in a structured manner by screening and diagnosing patients of HT and DM. Participants joined groups on social media to determine PROLANIS activity schedules. This group functions as a communication facility between facilitators and activity participants. In planning, the facilitator adapts to field conditions and activity participants.

We collaborate with mobile health centers to conduct screening methods for non-communicable diseases like diabetes (DM) and HT. Once individuals are diagnosed, we follow up with them through targeted activities called "Pusling." These Pusling activities typically involve directly visiting their communities to provide comprehensive support. We conduct basic health checks, deliver nutrition education sessions, and offer health promotion information, before completing the full program cycle for that location and moving on to the next. (Boalemo, informant 13)

…the first step before starting is to make an announcement in the WhatsApp group to the participants by telling them that there will be gymnastics and education session along with the exact schedule. For us, we just need to invite officers such as nurses, then me, doctors, and maybe the administration….(Yogyakarta, informant 1)

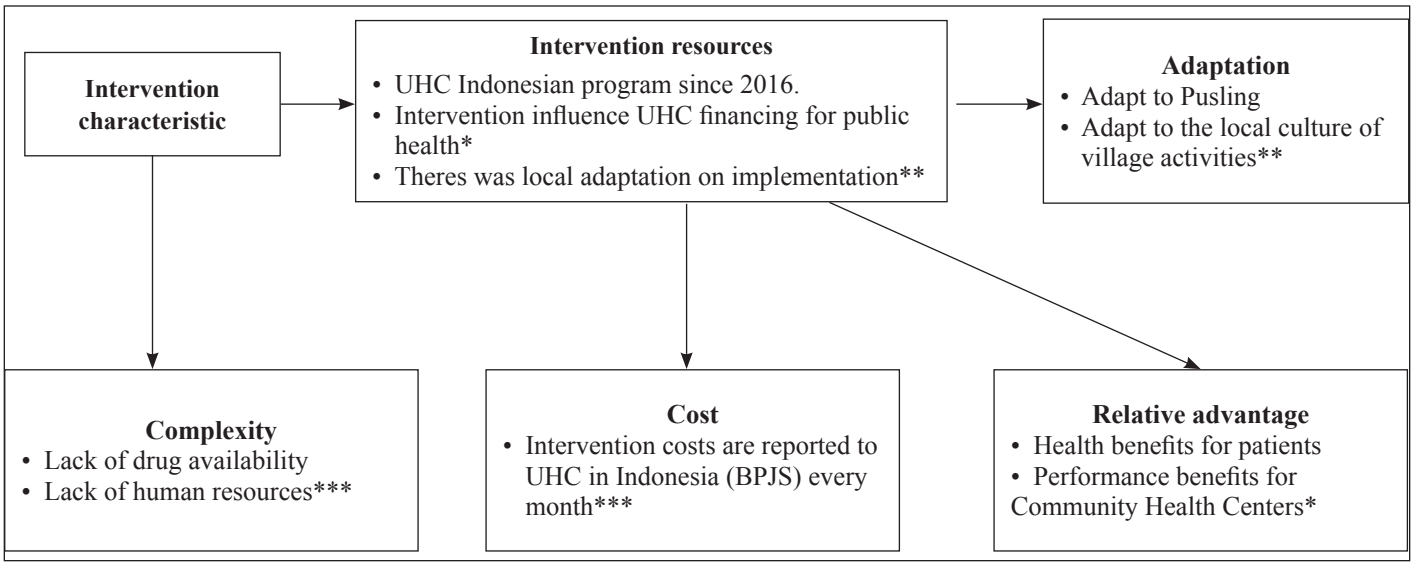
Engaging

As previously explained in the adaptation point, facilitators recruited and screened participants during village visits. The facilitators were nurses, nutritionists, pharmacists, and doctors. The facilitator involved can change according to the activities planned by the community health care.

"... Our PROLANIS activity team consists of 6–7 members, including 1 doctor and 5 nurses. The nurses, trained in basic gym instruction, will lead the combined exercise session alongside dedicated gym instructors. Meanwhile, a designated area will be set up for participants to have their blood pressure checked before or after the workout. As an innovative addition for 2023, we're incorporating traditional acupressure techniques into the exercise routine. Trained professionals will apply acupressure points during breaks." (Kupang, informant 11).

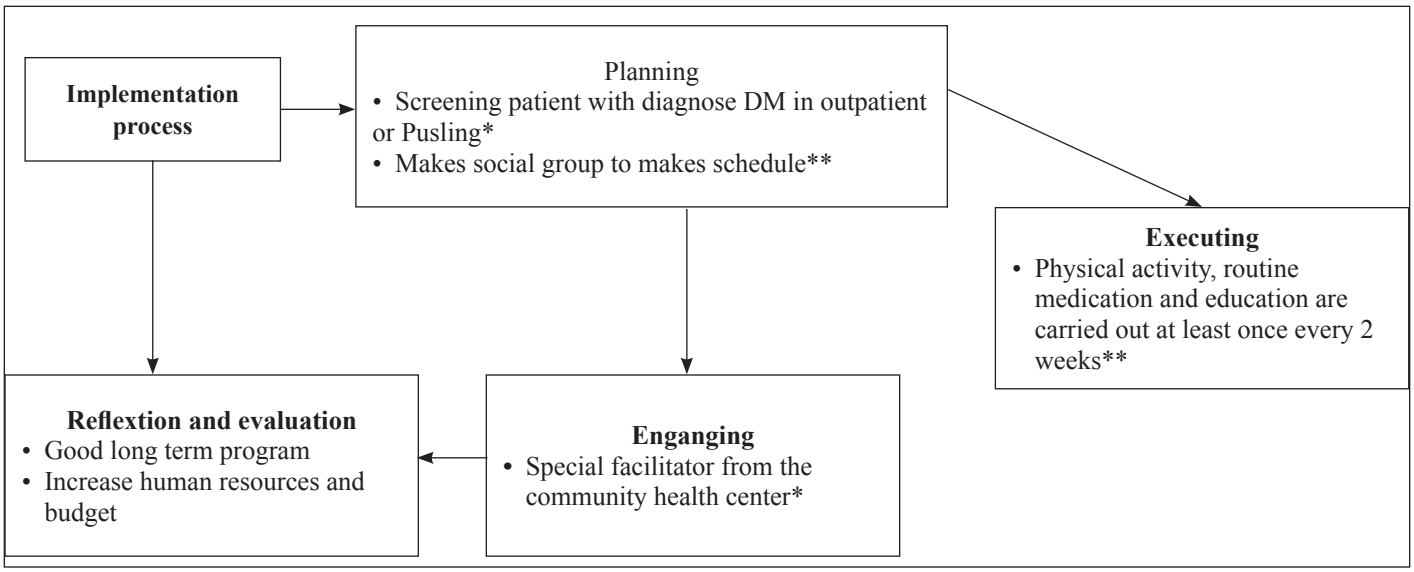
Executing

PROLANIS activities are generally carried out once every 2 weeks on a rotating basis. Participants in the HT group will get their own schedule and participants in the DM group will get their own schedule. This group will receive medical consultations and also different laboratory checks, while the material presented in the activity is tailored to the participants'



*) relationship between intervention resources and relative advantage.
**) relationship between intervention resources and adaptation.
***) relationship between cost and complexity.

Figure 2. Relationship intervention characteristic.



*) relationship between enganging and planning.
**) relationship between executing and planning.

Figure 3. Relationship implementation process.

needs. The facilitator allows HT club participants to take part in DM club activities and vice versa, although not all health centers enforce it.

….. implementation is in accordance with what is recommended by BPJS, DM and HT targets...the schedules are also different. 2nd week is for DM, HT is in week 4. For example, if you want to take part in both, you can do so... because sometimes there are educational activities such as physiotherapy for DM...(Denpasar, informant 7)

Reflextion and evaluation

Reflection and evaluation points, the informants emphasized the budget and also human resources. Informants who have problems with human resources have difficulty dividing their time due to the double job desk at the community health center.

...this program is good, because at the Community Health Center we have a target,…a target to control DM patients by what percentage to be able to get full capitation…. (Yogyakarta, Informant 4).

DISCUSSION

In this study, we examined the implementation of the program across three geographically distinct 5 regions, Reginal I (Yogyakarta), Regional II (Denpasar), Regional III (Boalemo), Regional IV (Palangkaraya), and Regional V (Kupang) Figure 1. These areas showed that most informants carried out PROLANIS activities according to operational standards set by UHC. Activities originating from UHC are carried out routinely every month by the PROLANIS activity implementation team at the Community Health Center. PROLANIS activities at community health centers generally started in 2016. Variations in program complexity were observed in terms of characteristics, adaptation, and complexity.

PROLANIS activity implementation is significantly influenced by regional adaptations, as Figure 2 demonstrates. This relationship extends to intervention resources and program design. For example, in Denpasar, the facilitator identified an existing tradition of community physical activity called the "Banjar" association. They cleverly adapted this practice by integrating it with village customs to effectively invite more people to join organized PROLANIS activities. The facilitator in Denpasar creatively adapted the existing tradition of community physical activity called the "Banjar" association. By integrating it with village customs like [specific custom used], they effectively encouraged larger participation in organized PROLANIS activities. Similarly, in Boalemo, partnering with the "pusling" mobile health center proved immensely beneficial. "Pusling" teams visiting villages routinely for medical checkups seamlessly incorporated PROLANIS activities into their schedule. This involved gathering patients in a container for interactive sessions of gymnastics and educational workshops focused on diabetes management. Informants in Boalemo particularly emphasized the value of this approach for elderly patients. They not only received physical activity and education about pain management within the familiar "pusling" setting, but also gained access to treatment, traditional health practices like acupressure, and valuable opportunities for peer interaction and knowledge exchange about healthy diets and exercise routines. Such comprehensive support, along with the scientifically proven benefits of physical activity and education, is likely to contribute to weight loss in diabetic patients, increased medication adherence [19], and even prevention of diabetes [6,7,20,21]. These benefits include increasing patient productivity and increasing compliance with taking medication with counseling from pharmacists, doctors, and other health workers so that the health quality of prolanis participants is more focused and controlled.

Human resource limitations emerged as a significant barrier in Region IV (Palangkaraya), mirroring findings from research on DPP implementation that highlight time constraints as a major hurdle [21,22]. This lack of available personnel made it difficult to cater to the high participant enthusiasm in Region IV (Kupang), leading to concerns about exceeding the allocated budget. Drug management proved challenging in both Region III (Boalemo) and Region IV (Kupang), partly due to their location in urban areas with challenging transportation networks. This limited the local affordability of medications and made reliable drug distribution systems difficult to implement. Concerns about drug availability in remote areas echo findings from previous research highlighting barriers to essential medicines in developing countries, often related to production or access limitations [23–25].

While the National DPP offers a general framework, variations in its implementation across regions are vast, and largely influenced by adaptation and complexity. This is evident in program planning, where each region customizes its approach to suit local needs. As Figure 3 showcases, a common practice involves involving participants in schedule design through their representatives, known as club leaders, who then liaise with the facilitator team [22,26,27]. Interestingly, some regional adaptations show remarkable similarities. For example, Regions III and IV share effective strategies for reaching out to villages, often by collaborating with mobile health centers like "pusling" programs. This aligns with research findings demonstrating that program managers readily modify evidence-based interventions based on factors like target audience needs, resource availability, and their own expertise [28–30]. Notably, in PROLANIS, activities are always facilitated by healthcare professionals within community health centers (Fig. 3). This approach, with its built-in support and guidance, has demonstrably positive impacts on patient compliance, as studies have shown that independent activity and without therapy supervision by health worker (pharmacist and doctor) can sometimes lead to reduced adherence [31].

Prior observational studies in the DIPLOMA evaluation highlighted variations in how providers delivered the program, emphasizing the importance of program adaptation for effectiveness [32] This is echoed by research on type 2 diabetes self-management programs, where barriers of cost, time, and cultural mismatch can prevent participation by members of underrepresented groups [20]. However, studies also offer promising examples of programs successfully adapting to meet the specific needs of these communities. Such targeted approaches demonstrate the potential for culturally appropriate and individualized program delivery to improve acceptance and efficacy within marginalized cohorts [33].

While the COVID-19 pandemic did severely impact on the implementation and delivery of the NHS DPP, local leads suggest that this led to an increased focus within localities on prevention work. There was recognition that people who had a diagnosis of diabetes were shown to be at higher risk of developing severe COVID-19 disease and at a greater risk of death [34] compared to people without a diabetes diagnosis. In addition, those from South Asian or Black ethnic origin were at increased risk of mortality from COVID-19 compared to those from white ethnicities [35]. Local leads identified how providers worked quickly to deliver the NHS DPP remotely and supported patients in using technology. This reflects similar reports of innovation in diabetes care during the pandemic, to transfer to a digital platform [36].

This study significantly advances knowledge on the implementation of the National DPP across diverse settings in Indonesia. However, it's important to acknowledge some limitations. Interviewing only 1 program facilitator at each of the 19 community health centers from 5 regions prevented the full capture of the range of perceptions regarding PROLANIS activity implementation. Additionally, limiting our focus to in-depth interviews with facilitators means the perspectives of resource persons and policy providers from BPJS Indonesia are currently missing. Including their insights in future research would provide a more nuanced understanding of program design, resource allocation, and potential modifications for improved effectiveness.

CONCLUSION

This study identified the CFIR domain of adaptability as crucial for PROLANIS activities. Informants emphasized the need to adapt activities to both geographical conditions and specific participant needs. These adaptations, along with the program's focus on physical activity and education by health workers, were supported by data showing improved blood sugar control, weight management, and increased adherence and overall well-being in elderly diabetes patients. While most community health centers adhered to operational standards to a considerable degree, informants in remote areas highlighted the need for increased budget and human resources to ensure optimal program delivery. Addressing these resource challenges, along with continued adaptability to diverse contexts, can significantly enhance the nationwide impact of PROLANIS activities, particularly in regions where support for elderly diabetes patients is most crucial. A future perspective on prolanis activities based on interview results could be useful for preventing patient complications, increasing compliance, as well as reducing overall treatment costs for diabetes both from insurance and also for the patient.

ACKNOWLEDGMENTS

The authors would like to thank the Ministry of Research, Technology, and Higher Education Republic of Indonesia.

AUTHOR CONTRIBUTIONS

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. All the authors are eligible to be an author as per the International Committee of Medical Journal Editors (ICMJE) requirements/guidelines.

FINANCIAL SUPPORT

There is no funding to report.

CONFLICTS OF INTEREST

The authors report no financial or any other conflicts of interest in this work.

ETHICAL APPROVALS

The study protocol was approved by Medical and Health Research Ethics Committee of Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Indonesia (Approval number: KE/FK/1652/EC/2022; Date: 26 DEC, 2022). Potential participants were thoroughly informed about the study through detailed information sheets, and their written consent was secured.

DATA AVAILABILITY

All data generated and analyzed are included in this research article.

PUBLISHER'S NOTE

All claims expressed in this article are solely those of the authors and do not necessarily represent those of the publisher, the editors and the reviewers. This journal remains neutral with regard to jurisdictional claims in published institutional affiliation.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declares that they have not used artificial intelligence (AI)-tools for writing and editing of the manuscript, and no images were manipulated using AI.

REFERENCES

1. Bommer C, Heesemann E, Sagalova V, Manne-Goehler J, Atun R, Bärnighausen T, et al. The global economic burden of diabetes in adults aged 20-79 years: a cost-of-illness study. Lancet Diabetes Endocrinol. 2017 Jun;5(6):423–30. Doi: https://doi.org/10.1016/S2213-8587(17)30097-9
2. Glovaci D, Fan W, Wong ND. Epidemiology of diabetes mellitus and cardiovascular disease. Curr Cardiol Rep. 2019 Mar 4;21(4):21. Doi: https://doi.org/10.1007/s11886-019-1107-y
3. Home, Resources, diabetes L with, Acknowledgement, FAQs, Contact, et al. IDF Diabetes Atlas | Tenth Edition [Internet]. [cited 2023 Apr 15]. Available from: https://diabetesatlas.org/
4. Sitompul S, Suryawati C, Wigati PA. Analisis Pelaksanaan Program Pengelolaan Penyakit Kronis (Prolanis) Bpjs Kesehatan Pada Dokter Keluarga Di Kabupaten Pekalongan Tahun 2016. Jurnal Kesehatan Masyarakat. 2016 Nov 1;4(4):145–53.
5. Forbes JM, Cooper ME. Mechanisms of diabetic complications. Physiol Rev. 2013 Jan;93(1):137–88. Doi: https://doi.org/10.1152/physrev.00045.2011
6. Wu Y, Ding Y, Tanaka Y, Zhang W. Risk factors contributing to type 2 diabetes and recent advances in the treatment and prevention. Int J Med Sci. 2014;11(11):1185–200. Doi: https://doi.org/10.7150/ijms.10001
7. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002 Feb 7;346(6):393–403. Doi: https://doi.org/10.1056/NEJMoa012512
8. Badan Penyelenggara Jaminan Sosial. Administratif Kepesertaan Program Jaminan Kesehatan, Peraturan BPJS Kesehatan No.5 Tahun 2020. Jakarta, Indonesia: Kementrian Kesehatan RI; 2020.
9. Assupina M, Misnaniarti M, Rahmiwati A. Analysis of implementation of the chronic disease management program (Prolanis) at family doctor of PT askes in Palembang on 2013. JIKM. 2013;4(3):254–61.
10. Sari NM. Analisis implementasi program Pengelolaan Penyakit Kronis (Prolanis) BPJS Kesehatan pada Puskesmas Di Kabupaten Sukoharjo [Internet] [other]. Semarang, Indonesia: Diponegoro University; 2015 [cited 2023 Nov 1]. Available from: http://eprints.undip.ac.id/47357/
11. Badan Penelitian dan Pengembangan Kesehatan. Laporan Nasional Riskesdas 2018. Jakarta, Indonesia: Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan; 2020.
12. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009 Aug 7;4:50. Doi: https://doi.org/10.1186/1748-5908-4-50
13. Kirk MA, Kelley C, Yankey N, Birken SA, Abadie B, Damschroder L. A systematic review of the use of the consolidated framework for implementation research. Implement Sci. 2016 May 17;11:72. Doi: https://doi.org/10.1186/s13012-016-0437-z
14. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated consolidated framework for implementation research based on user feedback. Implement Sci. 2022 Oct 29;17(1):75. Doi: https://doi.org/10.1186/s13012-022-01245-0
15. Birken SA, Powell BJ, Presseau J, Kirk MA, Lorencatto F, Gould NJ, et al. Combined use of the consolidated framework for implementation research (CFIR) and the theoretical domains framework (TDF): a systematic review. Implement Sci. 2017 Jan 5;12(1):2. Doi: https://doi.org /10.1186/s13012-016-0534-z
16. Breimaier HE, Heckemann B, Halfens RJG, Lohrmann C. The consolidated framework for implementation research (CFIR): a useful theoretical framework for guiding and evaluating a guideline implementation process in a hospital-based nursing practice. BMC Nurs. 2015;14:43. Doi: https://doi.org /10.1186/s12912-015-0088-4
17. Pinnock H, Barwick M, Carpenter CR, Eldridge S, Grandes G, Griffiths CJ, et al. Standards for reporting implementation studies (StaRI) Statement. BMJ. 2017 Mar 6;356:i6795. Doi:https://doi.org /10.1136/bmj.i6795
18. Powell BJ, Waltz TJ, Chinman MJ, Damschroder LJ, Smith JL, Matthieu MM, et al. A refined compilation of implementation strategies: results from the expert recommendations for implementing change (ERIC) project. Implement Sci. 2015 Feb 12;10:21. Doi:https://doi.org /10.1186/s13012-015-0209-1
19. Ponciano IC, Seixas MB, Peçanha T, Pereira AL, Trevizan PF, Britto RR, et al. Maintenance of physical activity behavior by individuals with prediabetes and diabetes during the COVID-19 pandemic after completing an exercise intervention in Brazil. Int J Environ Res Public Health. 2022 Jul 21;19(14):8857. Doi:https://doi.org /10.3390/ijerph19148857
20. Ida Krisnadewi K, Ari Kristina S, Endarti D, Andayani TM. Health interventions and its impact on outcomes among diabetic patients: a systematic review. Pharm Sci Asia. 2022 Apr 22;4(49):304–11. Doi:https://doi.org /10.29090/psa.2022.04.22.04
21. Balagopal P, Kamalamma N, Patel TG, Misra R. A community-based participatory diabetes prevention and management intervention in rural India using community health workers. Diabetes Educ. 2012;38(6):822–34.
22. Wilson HK, Wieler C, Bell DL, Bhattarai AP, Castillo-Hernandez IM, Williams ER, et al. Implementation of the diabetes prevention program in georgia cooperative extension according to RE-AIM and the consolidated framework for implementation research. Prev Sci. 2023 Mar 17;25:1–12.

23. Kristina S, Aditama H, Endarti D, Widayanti A. Evaluating accessibility of essential medicines in Indonesia: a survey on availability and prices in public and private health sectors. Int J Pharm Res. 2020 Feb 27;12:692–9.
24. Wagenaar BH, Gimbel S, Hoek R, Pfeiffer J, Michel C, Manuel JL, et al. Stock-outs of essential health products in Mozambique-longitudinal analyses from 2011 to 2013. Trop Med Int Health. 2014 Jul;19(7):791–801.
25. Dave CV, Pawar A, Fox ER, Brill G, Kesselheim AS. Predictors of drug shortages and association with generic drug prices: a retrospective cohort study. Value Health. 2018 Nov;21(11):1286–90.
26. Madrigal L, Manders OC, Kegler M, Haardörfer R, Piper S, Blais LM, et al. Inner and outer setting factors that influence the implementation of the National Diabetes Prevention Program (National DPP) using the consolidated framework for implementation research (CFIR): a qualitative study. Implement Sci Commun. 2022 Oct 1;3(1):104.
27. Damschroder LJ, Moin T, Datta SK, Reardon CM, Steinle N, Weinreb J, et al. Implementation and evaluation of the VA DPP clinical demonstration: protocol for a multi-site non-randomized hybrid effectiveness-implementation type III trial. Implement Sci. 2015 May 12;10:68.
28. Galbraith JS, Stanton B, Boekeloo B, King W, Desmond S, Howard D, et al. Exploring implementation and fidelity of evidence-based behavioral interventions for HIV prevention: lessons learned from the focus on kids diffusion case study. Health Educ Behav. 2009 Jun;36(3):532–49.
29. Payne AA, Eckert R. The relative importance of provider, program, school, and community predictors of the implementation quality of school-based prevention programs. Prev Sci. 2010 Jun;11(2):126–41.
30. Palinkas LA, Schoenwald SK, Hoagwood K, Landsverk J, Chorpita BF, Weisz JR, et al. An ethnographic study of implementation of evidence-based treatments in child mental health: first steps. Psychiatr Serv. 2008 Jul;59(7):738–46.
31. Matsushita M, Muramoto A, Nomura E, Eguchi Y, Kato A, Sano Y, et al. The smart life stay (SLS) program: effects of a lifestyle intervention program in combination with health tourism and health guidance for type 2 diabetes. Nutr Diabetes. 2020 Aug 29;10(1):33.
32. Hawkes RE, Cameron E, Cotterill S, Bower P, French DP. The NHS diabetes prevention programme: an observational study of service delivery and patient experience. BMC Health Serv Res. 2020 Nov 27;20(1):1098.
33. Hadjiconstantinou M, Quinn LM, Tippins F, Schreder S, Khunti K, Davies MJ. A perspective piece on diabetes self-management education and support (DSMES) programmes for under-represented groups with T2DM in the UK. Brs J Diabetes. 2021 May 28;21(1):3–10.
34. Shenoy A, Ismaily M, Bajaj M. Diabetes and covid-19: a global health challenge. BMJ Open Diabetes Res Care. 2020 Apr;8(1):e001450.
35. Aldridge RW, Lewer D, Katikireddi SV, Mathur R, Pathak N, Burns R, et al. Black, Asian and minority ethnic groups in England are at increased risk of death from COVID-19: indirect standardisation of NHS mortality data. Wellcome Open Res. 2020 Jun 24;5:88.
36. Quinn LM, Davies MJ, Hadjiconstantinou M. Virtual consultations and the role of technology during the COVID-19 pandemic for people with type 2 diabetes: the UK perspective. J Med Internet Res. 2020 Aug 28;22(8):e21609.

How to cite this article:
Krisnadewi KI, Kristina SA, Andayani TM, Endarti D. Implementation preventive program for diabetic mellitus (PROLANIS) at Community Health Center in Indonesia: A qualitative study. J Appl Pharm Sci. 2025;15(01):153–161.