COMMUNITY DIAGNOSIS IN AN EFFORT TO REDUCE DIABETES MELLITUS CASES IN THE KRONJO COMMUNITY HEALTH CENTER AREA

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ABSTRAK
Diabetes melitus (DM) merupakan masalah kesehatan global dengan prevalensi 589 juta orang dewasa pada tahun 2024. Jumlah ini diperkirakan meningkat menjadi 853 juta pada tahun 2050. Indonesia berada di peringkat ke-7 dunia dengan 10,7 juta kasus pada tahun 2019. Prevalensi DM di Indonesia naik dari 10,9% pada 2018 menjadi 11,7% pada 2023. Di Provinsi Banten, jumlah penderita DM tercatat 56.560 orang pada tahun 2011. Tujuan penelitian untuk meningkatkan pengetahuan masyarakat tentang DM serta dilakukannya deteksi dini DM yang diharapkan dapat menurunkan jumlah kasus DM. Penelitian dilakukan pada Desember 2024 – Januari 2025 dengan menggunakan pendekatan diagnosis komunitas untuk mengidentifikasi masalah digunakan paradigma *Blum*. Penentuan prioritas masalah dilakukan dengan teknik *non-scoring delphi,* akar penyebab masalah didapatkan dengan menggunakan diagram *fishbone*. Data hasil intervensi didapatkan melalui hasil *pre-test* dan *post-test*. Dilakukan pemantauan menggunakan *plan-do-check-act cycle,* serta melakukan evaluasi menggunakan pendekatan sistem. Hasil intervensi menunjukkan adanya peningkatan pengetahuan peserta tentang penyakit DM dengan terpenuhinya indikator keberhasilan yang telah ditetapkan, yaitu peningkatan nilai *post-test* setidaknya 10 poin, memperoleh nilai *post-test* mencapai ≥ 70, serta minimal 80% peserta memenuhi kedua kriteria tersebut. Berdasarkan intervensi yang telah dlaksanakan, disimpulkan bahwa intervensi tersebut dapat dinyatakan berhasil dan diharapkan dapat menurunkan jumlah kasus DM di wilayah kerja Puskesmas Kronjo.

Kata kunci   : diabetes melitus, diagnosis komunitas, diagram *fishbone*, paradigma *blum*

ABSTRACT
Diabetes mellitus (DM) is a global health problem with a prevalence of 589 million adults in 2024. This number is estimated to increase to 853 million in 2050. Indonesia is ranked 7th in the world with 10.7 million cases in 2019. The prevalence of DM in Indonesia increased from 10.9% in 2018 to 11.7% in 2023. In Banten Province, the number of DM sufferers was recorded at 56,560 people in 2011. The purpose of the study was to increase public knowledge about DM and early detection of DM, which is expected to reduce the number of DM cases. The study was conducted in December 2024 - January 2025 using a community diagnosis approach to identify problems using the Blum paradigm. Determining problem priorities was carried out using the non-scoring Delphi technique, and the root cause of the problem was obtained using a fishbone diagram. Intervention result data was obtained through pre and post-test results. Monitoring was carried out using the plan-do-check-act cycle, and evaluation was carried out using a systems approach. The results showed an increase in participants' knowledge about DM disease by fulfilling the established success indicators, namely an increase in post-test scores of at least 10 points, obtaining a post-test score of ≥70, and at least 80% of participants meeting both criteria. Based on the intervention that has been implemented, it is concluded that the intervention can be declared successful and is expected to reduce the number of DM cases in the Kronjo Health Center work area.

Keywords   : diabetes mellitus, community diagnosis, blum paradigm, fishbone diagram

INTRODUCTION
     Community diagnosis is a quantitative and qualitative description of community health and the factors that influence it. Community diagnosis can help provide a clear understanding

of health problems and the risk factors underlying them. With the existence of a community diagnosis, the information obtained can be the basis for designing interventions for health promotion and prevention in the community (Alberdi-Erice et al., 2021). Diabetes Mellitus (DM) is a condition characterized by high levels of glucose in the blood. Glucose, which comes from food, acts as the main source of energy for the body. The process of transporting glucose into body cells is assisted by insulin, a hormone produced by the pancreas. DM occurs when the body cannot produce adequate amounts of insulin, resulting in a buildup of glucose in the blood (IDF, 2013).

According to new data published in The Lancet on World Diabetes Day, the number of adults with diabetes has more than quadrupled since 1990, surpassing 800 million people globally. According to the WHO, between 1990 and 2022, the prevalence of diabetes increased from 7% to 14% worldwide. Almost 450 million adults aged 30 and older, or almost 59% of all adults with diabetes, were untreated in 2022, a 3.5-fold increase in the number of untreated individuals since 1990. This trend has resulted in severe global disparities. LMICs are home to 90% of these adults who are untreated. The organization emphasizes the urgent need for stronger action to address rising rates and treatment gaps, particularly in LMICs where treatment access is low (WHO, 2024).

According to global epidemiological data from the International Diabetes Federation (IDF), it is estimated that in 2024 there will be around 589 million adults aged 20-79 years who suffer from DM, and this number is predicted to increase to 853 million by 2050. In 2024, diabetes killed 3.4 million people, or one every six seconds. Of the 252 million persons (43%) with diabetes are thought to be undiagnosed. Nearly 90% reside in nations with low and moderate incomes. In 2024, diabetes was expected to have cost the world's health system USD 1.015 trillion. Over the last 17 years, this amounts to a 338% increase. Globally, 488 million adults (1 in 11) have impaired fasting glucose and 635 million adults (1 in 8) have impaired glucose tolerance, putting them at high risk for type 2 diabetes (IDF, 2025).

Based on the region, Southeast Asia is the only country in the Southeast Asia region that is included in the list of the 10 countries with the highest number of DM sufferers in 2019, namely Indonesia, which is in seventh place with a total of 10.7 million. This means that Indonesia has a large contribution to DM cases in Southeast Asia. It is estimated that in 2030, people with DM in Indonesia will reach 21.3 million people, and DM will also rank 7th as a cause of death in the world. The 2023 Indonesian Health Survey Report from the Ministry of Health shows that the prevalence of DM in all ages of the Indonesian population will reach 11.7% in 2023, which shows an increase compared to the results of the Basic Health Research (Ministry of Health of the Republic of Indonesia, 2018). The prevalence of DM was 10.9% in 2018 (IDF, 2025; Ministry of Health of the Republic of Indonesia, 2020; Sitorus et al., 2018; Ministry of Health of the Republic of Indonesia, 2023; Ministry of Health of the Republic of Indonesia, 2018).

According to data from the Banten Health Office in 2011, 56,560 people were recorded as suffering from DM in Banten Province. This disease is also included in the 20 main diseases in Tangerang. Based on Tangerang health data, the number of DM sufferers in 2015 reached 20,524 people. As part of Banten Province, Tangerang has the highest prevalence of DM compared to other districts or cities in the province, which is 1.7% according to the 2013 Riskesdas report. (Ministry of Health of the Republic of Indonesia, 2020). The number of DM cases at the Kronjo Health Center is included in the 10 highest diseases in health centers. Based on the data, the number of DM cases from June to November 2023 at the Kronjo Health Center reached 856 cases and then increased to 1,368 cases from June to November 2024. The increase in cases that occurs continuously every year will increase the government's burden related to health costs and decrease people's welfare. A community diagnostic approach needs to be carried out to further analyze the causal factors of DM cases and interventions that can be

carried out to prevent complications and increase public awareness for DM control in the Kronjo Health Center work area. This study aims to reduce the number of DM cases at the Kronjo Health Center, Kronjo District, Tangerang Regency, Banten.

METHODS

This study was based on a cross-sectional observational study. The study focused on Pagedangan Ilir Village, the working area of the Kronjo Health Center, Tangerang Regency, Banten Province in December 2024 - January 2025. Individuals or families with diabetes mellitus patients in the working area of the Kronjo Health Center were the study population. Individuals with DM or families with DM patients living in Pagedangan Ilir Village during the study period were included in the study sample. The community diagnosis approach was carried out by identifying problems using the Blum Paradigm. We used the Delphi non-scoring technique to prioritize the problems and a fishbone diagram to identify their root causes. We collected data by having participants fill out pre and post-test questionnaires. Monitoring during the intervention used the plan-do-check-action cycle, and a systems approach was carried out as an evaluation. The success indicators set in this study are an increase from pre-test to post-tes scores of at least 10 points or achieving a perfect score, with a post-test score of ≥ 70 points, with at least 80% meeting the two criteria above.

RESULTS

Pagedangan Ilir Village was recorded as the village with the highest increase in the number of DM cases during the June-November 2024 period, which was 344 cases. Pagedangan Ilir Village is also a village with a constant increase in the number of cases in the last 6 months, and in November 2024 it became the village with the highest number of DM cases, namely 83 cases, so we chose this village for community intervention in the diagnosis of DM problems.

An intervention was carried out in the form of counseling on diabetes mellitus and conducting DM screening by checking random blood sugar levels in the community in Pagedangan Ilir Village who were present. The intervention was carried out on January 4th, 2025 at 08.30 - 10.30 WIB at the Posyandu Edelweiss 3, Pagedangan Ilir Village. The activity began with filling in attendance, anthropometric measurements, and checking vital signs. After that, pre-test sheets were distributed to the participants who were present. After the filling was complete, the pre-test sheets were collected, and counseling was carried out using PowerPoint and projectors as well as distributing leaflets as counseling media. The activity continued with a 15-minute question-and-answer session and the completion of the post-test by participants for 10 minutes. Then, participants were checked for random blood sugar levels sequentially according to the attendance list. The target participants set were 30 participants, or all DM sufferers in Pagedangan Ilir Village. The samples collected during the intervention were in accordance with the target.

Table 1.   Characteristics of Study Participants

Characteristics	Total (N = 30)	*(Min;Max)*
Gender		
Female	28 (93.33%)	-
Male	2 (6.67%)	-
Age	-	(33-71)
Level of education		
Not attending school	1 (3.33%)	-
Primary/elementary school	24 (80%)	-
Junior high school	2 (6.67%)	-
Senior high school	3 (10%)	-

History of DM		
Yes	16 (53.33%)	-
No	10 (33.33%)	-
Didn't know	4 (13.33%)	-
GDS Result		
<200 mg/dL	10 (33.33%)	-
>200 mg/dL	20 (66.66%)	-

Of the 30 participants present, the age range of participants was 33-71 years. Participants who attended were dominated by women, namely (93.33%). As many as 80% of participants had a last level of education of elementary school. As many as 53.33% of participants had a history of DM. There were 66.66% of participants who had blood sugar >200 mg/dL when checked (table 1).

Table 2.   Success Indicators of This Study

Indicators	Total (N = 30)
Increase from pre-test to post-tes scores of at least 10 points, or achieving a perfect score	30 (100%)
Post-test score ≥70	26 (86.66%)
At least 80% meeting the 2 criteria above	26 (86.66%)

After the public health campaign, 100% of participants experienced an increase in pre-test to post-test scores of at least 10 points or achieved a perfect score. And around 86.66% of participants experienced an increase in knowledge about diabetes mellitus with a post-test score ≥70 (table 2).

DISCUSSIONS

The age range (33–71 years) aligns with Type 2 DM epidemiology, which peaks in middle age (Kautzky-Willer et al., 2016). Aging populations in rural areas face compounded risks due to limited healthcare access (Guariguata et al., 2014). Women comprised 93.33% of participants, reflecting a global trend where women dominate health interventions due to caregiving roles (Sohrabi et al., 2020). However, this disparity risks neglecting men's health needs, which may worsen outcomes in patriarchal societies (Garcia et al., 2019). Only 6.67% of participants were men, reflecting systemic barriers such as occupational demands or cultural norms. Similar gaps are reported in global health programs (Garcia et al., 2019), underscoring the need for male-targeted outreach. Future programs should address barriers to male engagement, such as work schedules or stigma. Around 80% of participants having only elementary education, health literacy challenges are evident. Low education correlates with poor chronic disease management (Bains & Egede, 2011), necessitating simplified messaging. The intervention's use of visual aids likely mitigated this barrier, as recommended for low-literacy groups (Islam et al., 2012).

Around 53.33% of participants had prior DM diagnoses, suggesting genetic or lifestyle risks prevalent in the community. Familial clustering of diabetes is common in Southeast Asia due to shared diets and sedentary lifestyles (Ali et al., 2019). A striking 66.66% of participants had random blood glucose >200 mg/dL, exceeding the diagnostic threshold for diabetes (ADA, 2021). This underscores a critical burden of undiagnosed or uncontrolled DM, consistent with rural Indonesia's limited healthcare access (Guariguata et al., 2014). Urgent screening and follow-up are needed to prevent complications. Random blood sugar checks provided immediate risk feedback, a strategy proven effective for early detection in resource-limited settings (Ramachandran et al., 2013). However, reliance on random testing (vs. fasting glucose or HbA1c) may underestimate accuracy (ADA, 2021), highlighting the need for confirmatory

diagnostics post-intervention. The intervention achieved an 86.66% improvement in post-test knowledge scores (>70), demonstrating the efficacy of structured health education. This aligns with studies showing that culturally tailored significantly enhances diabetes literacy, particularly in low-education populations (Alaofè et al., 2020). The use of visual aids (PowerPoint, leaflets) likely contributed to this success, as multimodal tools improve comprehension (Hawkins et al., 2018). The pre/post-test design quantified knowledge gains, a validated method in public health (Bloomfield & Pegram, 2015). The marked improvement suggests the intervention successfully conveyed essential DM concepts, although long-term retention requires reinforcement (Norris et al., 2002). Using leaflets and group sessions likely resonated with participants, as culturally adapted materials improve engagement in non-Western communities (Islam et al., 2012). This approach is critical in Indonesia, where communal learning is valued (Thabrany, 2019).

The high DM burden in Pagedangan Ilir Village calls for policy reforms, such as subsidized glucose monitoring and mandatory school-based health education. Such measures are vital to curb Indonesia's rising diabetes prevalence (Ogurtsova et al., 2017). Many participants likely face financial constraints limiting access to medications or testing. Economic hardship exacerbates diabetes outcomes in low-income regions (Beran et al., 2016), necessitating government subsidies or community partnerships. Training local DM patients as educators could enhance sustainability. Peer-led programs improve self-management in similar settings (Tang et al., 2014), fostering community ownership of health initiatives. Some of the obstacles faced during the intervention were that some of the people present had difficulty reading and writing, so they needed help filling out the pre-test and post-test sheets.

CONCLUSION

This study concluded that the community of Pagedangan Ilir Village experienced an increase in knowledge because they met the existing success indicators. Diabetes mellitus is a disease that needs attention because of the high morbidity and mortality rates due to this disease if the disease is not controlled properly. Lifestyle plays an important role because of the lack of knowledge, attitudes, and behavior of the community about this disease. The importance of interventions such as counseling to improve community knowledge, attitudes, and behavior about this disease, as well as routine control related to DM disease experienced, is expected to reduce the morbidity and mortality rates of diabetes mellitus sufferers. It is recommended that the Kronjo Health Center conduct counseling activities related to DM periodically.

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