



# *Community-Based Diabetes Mellitus Awareness and Blood Sugar Examination in Sukaraja Village, Medan City*

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Diabetes Mellitus (DM) is one of the degenerative diseases whose prevalence continues to increase globally, including in Indonesia, due to modern lifestyle changes. The 2023 Independent Community Service Program (KKN) was held in Ward VIII, Sukaraja Village, Medan City, with the aim of increasing public knowledge and awareness about DM. This activity includes counseling on the definition, risk factors, symptoms, and prevention of DM, which is complemented by checking blood sugar levels for the community. It includes an educational approach with presentations and PowerPoint posters to keep participants interested, as well as two-way interaction through question and answer sessions. A total of 50 participants participated in this activity, with high enthusiasm and active participation during the discussion. The results of fasting blood sugar checks during KKN activities showed that 31 out of 50 participants (62%) had blood sugar levels above 126 mg/dL, which is included in the abnormal category. These findings indicate a high risk of diabetes in the local community. Education and intervention regarding a healthy lifestyle and regular check-ups are important steps to prevent and manage diabetes. The activity showed an increase in public understanding of DM, which was characterized by positive feedback during counseling and examination sessions. During the implementation of PowerPoint presentations on diabetes in KKN activities, some technical glitches may appear, such as hardware problems on laptops or projectors, PowerPoint files that do not open, or internet connection glitches if the material relies on online

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sources. Based on the evaluation, the program emphasizes the importance of continuous health education and cross-sector collaboration to increase public awareness of DM and other degenerative diseases.

**Keywords:** *Diabetes Mellitus, Counseling, Blood Sugar Check, Independent KKN, Health Education.*

## 1. Introduction

Diabetes Mellitus (DM) is known as one of the leading causes of death due to non-communicable diseases (Astutisari et al., 2022). This disease is generally classified into several types, namely Type 1 Diabetes, Type 2 Diabetes, Gestational Diabetes, and other rare types (Mingqiang & Guanping, 2023). Type 1 diabetes is more commonly found at a young age and is caused by autoimmune damage to the pancreatic beta cells responsible for insulin production (Faida & Santik, 2020). Meanwhile, Type 2 Diabetes, which accounts for more than 90% of DM cases globally, often occurs in adults due to obesity-induced insulin resistance, lack of physical activity, and poor diet (Milita et al., 2021). Gestational diabetes, on the other hand, occurs in women during pregnancy and can increase the risk of complications in both mother and baby (Setiati et al., 2014).

In addition to severe medical complications, DM has a significant impact on public health and economic development. This disease not only increases the burden of health costs but also reduces community productivity (Adi, 2019). Long-term complications, such as heart disease, nephropathy, retinopathy, and amputation due to peripheral vascular disorders, increase the dependence of sufferers on expensive medical treatments. This results in a decrease in quality of life not only in affected individuals but also in families and communities that must provide support (Hariani et al., 2020).

A major challenge in controlling DM in developing countries, including Indonesia, is the low level of public awareness and limited access to health services (Ikhsan, 2021). The report shows that in Indonesia, the prevalence of DM is increasing in urban areas due to urbanization and a diet high in simple carbohydrates (Juita Syam et al., 2022). The low level of health literacy in rural areas also worsens the situation, so that many sufferers are unaware of their condition until they reach the stage of serious complications.

The Community Service Program (KKN) conducted by students of the University of Muhammadiyah North Sumatra in Ward VIII, Sukaraja, Medan City, is one of the community-based health education efforts that aims to increase public awareness about DM. This program involves direct counseling using interactive media, such as posters and PowerPoint presentations, accompanied by blood sugar checks as an early detection step. This counseling provides information on the definition of DM, risk factors, symptoms, and preventive measures that can be taken by the community (Martiningsih et al., 2022). Additionally, blood sugar testing provides practical benefits in identifying high-risk individuals, who can then be referred for further treatment (I Putu Sudayasa et al., 2024).

Community-based health education, such as the one carried out in this KKN program, has proven to be one of the most effective ways to reach the community at the grassroots level. By involving the community directly, this approach can create two-way communication that is more effective than mass media-based counseling. This kind of program also provides double benefits, namely increasing public knowledge about health while providing practical experience for students in applying the knowledge they learn.

Another challenge in managing DM is the need for a sustainable approach. Health counseling should not stop at just one program, but must be integrated into the national strategy for the control of non-communicable diseases. Governments, educational institutions, and health organizations need to work together to create systems that promote healthy lifestyles, including easy access to healthy foods, sports facilities, and preventive health services. In addition, investments in health technology, such as more affordable blood glucose monitoring tools, can help people with DM in managing their condition independently (Putri et al., 2022; Soelistijo, 2021).

On a global scale, WHO and other health organizations have emphasized the importance of preventive measures through the promotion of healthy lifestyles and

screening of high-risk populations (World Health Organization, 2020). Campaigns such as World Diabetes Day are used to raise public awareness about the threat of DM as well as preventive measures that can be taken. However, in developing countries such as Indonesia, the effectiveness of this campaign still needs to be improved by adjusting the approach method to local culture and the needs of the community (Rohmah, 2023).

The increase in the prevalence of DM is a reminder that the prevention and management of noncommunicable diseases must be a top priority in global and national health policy. The disease not only affects affected individuals but also burdens the health system and the economy as a whole. Therefore, collaborative efforts between the government, educational institutions, communities, and the private sector are urgently needed to create a healthier and resilient society against the threat of chronic diseases (Rosdiana, 2022).

## **2. Method**

The method used in the 2023 Independent Community Service Lecture (KKN) activity in Ward VIII, Sukaraja Village, Medan City focuses on providing health education about Diabetes Mellitus (DM) to the local community through counseling and blood sugar checks. This activity is designed to increase public understanding of DM and the importance of early detection in preventing more serious complications.

The first step in the implementation of this activity is coordination with various related parties. Before the implementation, the field supervisor, the head of the neighborhood, and the local village head were contacted to get permission and support. This coordination is important to ensure that activities run smoothly and in accordance with the local needs and context of the community. The coordination process has been carried out since the beginning of August 2023, and permission from the local authorities was obtained on August 16, 2023, after a location survey and material preparation.

The counseling provided to the community is carried out using two main methods: PowerPoint presentations and posters. The counseling material includes information about the definition of DM, symptoms that must be watched out for, risk factors, and prevention methods that can be done by the community to avoid this disease. During the counseling session, the facilitator uses two-way communication to ensure that participants can understand the material well and actively ask questions if there are things that are not clear. This is intended to reinforce participant understanding and ensure a more intense interaction between the facilitator and the audience.

After counseling, the next stage is a blood sugar check. This examination is carried out directly to the community who participates in the activity as a form of early detection of possible DM risks. Each participant who took part in the blood sugar test received an explanation of the results, and for those whose results were abnormal, they were given directions to carry out follow-up examinations at the nearest health facility. This blood sugar check is an important part of the activity because it can give a direct overview of the health of participants and provide motivation for them to care more about a healthy lifestyle.

Overall, the methods applied in this activity emphasize the importance of an educational approach based on the needs of the community. Through interactive counseling and direct health check-ups, this activity is expected to increase public awareness about DM and encourage healthier lifestyle changes to prevent this disease. With the evaluation through direct interaction, the public is expected to be able to more easily understand the importance of controlling this disease, which is also expected to reduce the prevalence of DM in the region.

## **3. Result and Discussion**

### **3.1 Results**

The implementation of the 2023 Independent Community Service Lecture (KKN) in Ward VIII, Sukaraja Village, Medan City aims to increase public awareness of Diabetes Mellitus (DM) through counseling and blood sugar checks. A total of 50 people from the community participated in this activity, which consisted of DM counseling and blood sugar checks for early detection. Counseling was conducted using PowerPoint media and

posters, which were accompanied by question and answer sessions to ensure better understanding among the participants. Blood sugar checks are done to assess their health conditions, whether they are in the normal category or at risk of developing DM.

Counseling begins with basic education about diabetes, including definitions, causes, risk factors, symptoms, and complications that can occur. In addition, emphasis is placed on the importance of a healthy lifestyle, such as maintaining a diet, exercising regularly, and checking blood sugar levels regularly. Counseling also

The community's response to this activity is quite positive. They showed enthusiasm during the session, with many questions asked about daily habits that can help prevent diabetes. Some participants also admitted that they had just understood the importance of a healthy lifestyle after participating in this counseling. This KKN activity is considered useful, especially because it directly provides practical information that is relevant to the health needs of the local community.

From the results of the fasting blood sugar test carried out, some participants showed blood sugar levels that exceeded the normal limit, which is an indication of a high risk of DM. Participants who have abnormal fasting blood sugar levels above 126 mg/dl are given directions to immediately carry out follow-up examinations at the nearest health facility. This activity not only provides education about DM but also increases individual awareness about the importance of regular health check-ups for early detection of diseases.

**Table 1. Blood Sugar Level Test Results**

<b>Blood Sugar Level</b>	<b>Frequency (n)</b>	<b>Percentage (%)</b>
Normal	19	38
High	31	62
<b>Total</b>	<b>50</b>	<b>100</b>

The results of fasting blood sugar checks carried out during KKN activities showed that of the 50 participants examined, as many as 31 people (62%) had fasting blood sugar levels above 126 mg/dL, which was categorized as abnormal values. These findings show a high prevalence of diabetes risk or pre-diabetic conditions in the local community. These results are a serious concern because they reflect the need for more intensive health interventions, including education on diet control, increased physical activity, and the importance of regular health check-ups to prevent diabetes complications in the future. This data also emphasizes the urgency of increasing public awareness about diabetes prevention and management.

These findings underline the critical importance of ongoing health education and community health programs to combat the rising prevalence of diabetes in local communities. Regular counseling sessions, lifestyle interventions, and accessible medical services are essential to address this health issue comprehensively. Moreover, collaboration with local health facilities can strengthen follow-up measures, ensuring individuals with abnormal blood sugar levels receive timely medical attention and guidance. By sustaining such initiatives, communities can be better equipped to manage and prevent diabetes, ultimately improving public health outcomes and reducing the burden of diabetes-related complications



Figure 1. Diabetes Mellitus Educational Poster

### 3.2 Discussion

The implementation of this KKN activity has succeeded in having a significant positive impact in increasing public understanding of Diabetes Mellitus (DM), both in terms of basic knowledge, symptoms, and prevention measures. Based on the results of the counseling carried out, the community showed high enthusiasm to know more about DM. This interest was evident in the many questions asked during the discussion sessions, covering topics such as the causes of DM, early signs that are often overlooked, as well as effective ways to manage risk through lifestyle changes. The interactive approach in counseling, which prioritizes two-way communication, has proven to be very effective. Participants feel more comfortable actively participating, sharing experiences, and getting answers directly from the facilitator, thus fostering a greater sense of involvement in this learning process.

However, although the overall response of participants was positive, the results of the blood sugar test revealed deeper challenges regarding the level of public awareness and attention to health, especially in terms of routine check-ups. Many participants only found out that they were at risk of DM after taking this check. This phenomenon highlights the lack of awareness of the importance of early detection and routine health checks as preventive measures. This unconsciousness can be caused by various factors, including lack of health education, limited access to health services, or even the assumption that health check-ups are only necessary if obvious symptoms have arisen. This emphasizes the need for a more intensive and extensive education program to reach community groups who have not been touched by information about the importance of DM prevention.

This activity also underscores the strategic role of the government and related parties in supporting public health efforts. The provision of affordable and easily accessible health facilities is one of the important factors to increase public awareness, especially in areas with limited resources. In addition, collaboration between the health sector, education, and local communities is needed to create an environment that supports the implementation of a healthy lifestyle. Education about DM through counseling like this will only be effective if it is accompanied by continuous follow-up, such as regular health monitoring programs, training of local health cadres, and campaigns that encourage healthy habits at the community level.

Overall, this activity can be said to be successful in providing in-depth and relevant education on DM prevention, but the challenge of ensuring community behavior change remains. Lifestyle changes, such as adopting a healthy diet, increasing physical activity, and the habit of regular health checkups, require a systematic and consistent approach. Therefore, continuous efforts are needed, such as periodic counseling, involvement of community leaders, and increased access to health services, to ensure a significant reduction in the prevalence of DM in the community. With an integrated and long-term oriented strategy, it is hoped that the public will not only have a better understanding of DM, but also be able to implement preventive measures effectively in their daily lives.

#### 4. Conclusion

The 2023 Independent Community Service Lecture (KKN) activity in Ward VIII, Sukaraja Village, Medan City, has succeeded in increasing public knowledge about Diabetes Mellitus (DM) through interactive counseling and blood sugar checks for early detection. From the results of the implementation of the activity, the community showed high enthusiasm for the material presented, as well as a positive response in discussing and asking questions about the prevention and management of DM. Blood sugar checks also provide real benefits for participants, who can find out their health status related to DM.

However, although many participants gained a better understanding of DM, the results of the examination showed that awareness of the importance of routine check-ups was still low. This shows that, even though education has been carried out, there is still a need to expand counseling and support the community to be more proactive in maintaining their health. Going forward, there will be a need for sustained efforts and collaboration between the government, educational institutions, and the community to create an environment that supports the prevention of DM and ensure that information about health reaches all levels of society in a way that is easily accessible and understood.

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