JAMAKA : Jurnal Pengabdian Masyarakat
Volume 1 Nomor 3 Oktober 2025
e-ISSN: XXXX-XXX; p-ISSN: XXXX-XXX, Hal 39-46
DOI: https://doi.org/xx.xxxx
Available online at: https://xxxx.xxx

Health Promotion to Prevent Diabetes Mellitus through Balanced Nutrition Education

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Article History:
Received: September 13, 2025;
Revised: September 27, 2025;
Accepted: October 15, 2025;
Published: October 31, 2025.

Keywords: *Balanced Nutrition; Community Empowerment; Diabetes Prevention; Health Education; Lifestyle.*

Abstract: *Health problems related to lifestyle, especially diabetes mellitus, are increasingly common in communities with limited knowledge of balanced nutrition. This community service program aimed to promote health awareness and prevent diabetes mellitus through education on balanced nutrition among adult residents. The method used was participatory education, consisting of counseling sessions, group discussions, and demonstrations on meal planning and portion control. Participants were guided to understand the importance of maintaining blood sugar levels through dietary regulation and physical activity. The results showed an increase in participants' knowledge and awareness regarding healthy eating patterns and diabetes prevention. Many participants reported behavioral changes, such as reducing sugar consumption and increasing the intake of vegetables and fruits. The activity also fostered a supportive environment for adopting healthy lifestyles in the community. It is concluded that balanced nutrition education effectively enhances community understanding and preventive behavior against diabetes mellitus. This program can serve as a model for similar community-based health promotion initiatives to reduce non-communicable disease risks in the future.*

1. INTRODUCTION

Health is a fundamental aspect of sustainable community development, particularly in improving quality of life and productivity. One of the major public health issues currently increasing in Indonesia is diabetes mellitus (DM). According to the Indonesian Ministry of Health (2023), the prevalence of diabetes among adults has reached 11.8%, showing a significant rise compared to previous years. This condition is strongly linked to poor dietary habits, low levels of physical activity, and limited public knowledge about balanced nutrition and healthy lifestyles.

The target community of this service program consists of adults living in rural areas who tend to consume foods high in sugar and fat but low in fiber. Such dietary patterns contribute to the growing risk of non-communicable diseases, particularly diabetes mellitus. The selection of this community was based on the urgent need to improve awareness and knowledge regarding healthy eating patterns and preventive behaviors through balanced nutrition education.

The main issue addressed in this community service project is the lack of understanding about the role of balanced nutrition in preventing diabetes mellitus. Health promotion through

education is an effective approach to empower communities to adopt healthy lifestyles. This program emphasizes participatory learning, enabling participants to actively engage in discussions and practical demonstrations related to balanced meal planning and portion control.

The primary goal of this activity is to increase public awareness, knowledge, and skills in implementing balanced nutrition principles as a preventive effort against diabetes mellitus. Through counseling sessions, interactive discussions, and practical workshops, the program aims to inspire behavioral changes, such as reducing sugar consumption, increasing vegetable and fruit intake, and maintaining regular physical activity.

It is expected that this community service activity will bring about social change by fostering a culture of healthy living among community members. In the long term, the implementation of balanced nutrition education can reduce the incidence of diabetes and improve overall public health. Furthermore, this program supports the government's initiative to prevent non-communicable diseases through education-based health promotion and community empowerment.

2. METHOD

This community service activity was carried out using a participatory action approach that emphasizes collaboration and empowerment of the target community. The subjects of this program were adult residents in the rural area of Sukamaju Village, consisting of 35 participants aged 25–55 years, both male and female. The selection of this community was based on preliminary observations and interviews showing a high prevalence of unhealthy dietary habits, particularly excessive sugar intake and lack of nutritional knowledge. The implementation took place in the Sukamaju Village Hall, which served as the central location for meetings, discussions, and practical demonstrations.

The planning process involved active participation from the target community. Before the activity, a needs assessment was conducted through focus group discussions (FGDs) to identify participants' level of knowledge, dietary patterns, and health concerns. The results of this assessment became the basis for designing the educational materials and activities. The community was also involved in scheduling the sessions, preparing facilities, and disseminating information to other residents, thus fostering a sense of ownership and collective responsibility.

The implementation strategy was divided into three main stages: (1) preparation, which included coordination with local health officials and community leaders; (2) implementation, consisting of counseling sessions on balanced nutrition, interactive discussions about healthy

lifestyles, and demonstrations on preparing nutritious and low-sugar meals; and (3) evaluation, where pre-test and post-test questionnaires were administered to measure participants' understanding and behavioral changes after the program.

The research method used in this program was descriptive participatory research, aimed at identifying community needs, implementing appropriate interventions, and evaluating their effectiveness. Data collection involved both qualitative methods (interviews, observations, and group discussions) and quantitative methods (knowledge assessment questionnaires). This mixed-method approach ensured a comprehensive understanding of community conditions and the program's outcomes.

During the preparation stage, coordination meetings were conducted with local stakeholders, including the village head, community health center staff, and women's groups. These meetings aimed to ensure that the program aligned with the community's needs and health priorities. Additionally, health workers provided input on relevant nutrition topics and local dietary patterns, enriching the content of the educational sessions.

The implementation phase consisted of three core activities: education, demonstration, and mentoring. The educational session introduced concepts of balanced nutrition, sources of macro and micronutrients, and the impact of excessive sugar consumption. Demonstrations focused on preparing simple and affordable meals using locally available ingredients. Meanwhile, mentoring allowed participants to practice new habits and receive feedback from facilitators to ensure the sustainability of behavioral changes.

In the evaluation phase, participants completed pre- and post-tests to measure changes in knowledge levels regarding balanced nutrition and diabetes prevention. Observations and interviews were also conducted to assess shifts in daily dietary habits. The data were analyzed descriptively, highlighting improvements in understanding and motivation to adopt healthier lifestyles.

Overall, the participatory method ensured that the program was not only educational but also empowering. By involving the community throughout every stage—from planning to evaluation—participants developed a stronger sense of responsibility for maintaining their health. The collaborative process fostered mutual learning between facilitators and participants, ensuring that health promotion efforts could continue independently after the program concluded.

3. RESULTS

The community service program on "Health Promotion to Prevent Diabetes Mellitus through Balanced Nutrition Education" produced significant outcomes in terms of community participation, knowledge improvement, and behavioral change. The program was implemented over four weeks through a series of structured activities, including health education, group discussions, cooking demonstrations, and continuous mentoring. Each activity aimed to build participants' understanding of balanced nutrition and encourage them to adopt healthier eating habits as part of daily life.

During the implementation phase, participants actively engaged in counseling sessions that discussed the importance of balanced nutrition, the dangers of excessive sugar intake, and the role of physical activity in diabetes prevention. Interactive discussions revealed that many participants previously believed that diabetes was solely hereditary, without realizing the impact of lifestyle and diet. After the sessions, most participants demonstrated improved comprehension of nutritional concepts and expressed motivation to make gradual dietary changes.

Cooking demonstrations became one of the most appreciated activities, as participants were taught how to prepare nutritious and affordable meals using local ingredients. They learned practical techniques to reduce sugar, salt, and oil consumption while maintaining food taste and nutritional value. As a result, participants were able to replicate the recipes at home, showing the applicability of the program beyond the learning sessions. Some participants even initiated small group cooking activities in their neighborhood, signaling the start of local community-driven health initiatives.

Mentoring and follow-up activities were carried out to monitor behavioral progress. Facilitators conducted home visits and follow-up meetings to evaluate the adoption of new eating patterns. Approximately 80% of participants reported decreasing their sugar intake and increasing their consumption of vegetables and fruits. Furthermore, the pre- and post-test results showed a 35% increase in knowledge scores about balanced nutrition and diabetes prevention. These findings indicate the program's success in fostering cognitive and behavioral transformation.

From a social perspective, the program also encouraged the emergence of local leadership and community solidarity. A group of motivated participants, primarily women, volunteered to become local health ambassadors who would continue promoting healthy eating practices in their surroundings. This initiative demonstrated the creation of new social structures that supported collective health improvement. In addition, there was a noticeable rise

in community awareness about the importance of health check-ups and active participation in local health programs. Such transformations indicate the beginning of sustainable social change driven by increased knowledge and shared responsibility for health promotion.

4. DISCUSSION

The results of this community service activity demonstrate that health promotion through balanced nutrition education can significantly improve knowledge, awareness, and behavioral changes related to diabetes prevention. The increased understanding among participants about the relationship between diet, lifestyle, and diabetes mellitus reflects the effectiveness of participatory-based educational interventions. This aligns with Nutbeam's (1998) theory of health promotion, which emphasizes empowerment and active community participation as key factors in achieving sustainable behavioral change.

The findings also support previous studies showing that education and counseling are effective strategies for enhancing public knowledge of non-communicable disease prevention (World Health Organization, 2020). The use of participatory methods—such as group discussions and cooking demonstrations—enabled the transfer of knowledge to occur interactively, bridging the gap between theory and daily practice. According to Green and Kreuter's PRECEDE–PROCEED model (2005), health behavior change is more likely when individuals are involved in identifying their needs and designing the interventions themselves, as was implemented in this program.

The emergence of local health ambassadors as new community leaders represents a form of social transformation. This development aligns with the concept of community empowerment proposed by Wallerstein (2006), which suggests that empowerment occurs when individuals and groups gain control over decisions and actions that affect their health. The involvement of these local leaders ensures the sustainability of the program by enabling the community to take ownership of health initiatives beyond the period of direct facilitation.

Behavioral change observed among participants, such as reducing sugar consumption and increasing fruit and vegetable intake, confirms Bandura's (1986) social cognitive theory, which posits that learning occurs through observation, imitation, and reinforcement within a social environment. The role of facilitators and peer groups in this project provided both informational and emotional support, reinforcing participants' self-efficacy to adopt healthier habits. These findings also resonate with the health belief model, where perceived susceptibility and perceived benefits motivate individuals to modify their health behavior

(Rosenstock, 1974).

From a broader perspective, the program illustrates how integrated community education can lead to collective awareness and shared responsibility for health improvement. The participatory approach allowed the community to experience a shift from passive health recipients to active health agents. This shift not only aligns with contemporary public health theories emphasizing social determinants of health but also supports the national agenda of promoting preventive health behavior. Therefore, the theoretical implications of this activity suggest that participatory health education can serve as an effective model for community-based disease prevention and the development of sustainable, health-oriented social structures.

5. CONCLUSION

The community service program titled "Health Promotion to Prevent Diabetes Mellitus through Balanced Nutrition Education" has proven effective in enhancing community awareness, knowledge, and behavioral changes toward healthier lifestyles. Through a participatory and educational approach, participants not only gained a better understanding of the relationship between diet and diabetes but also demonstrated tangible behavioral improvements, such as reducing sugar consumption and increasing the intake of vegetables and fruits. This outcome reflects the importance of combining health education with active community engagement to achieve sustainable health behavior transformation.

Theoretically, this program reinforces the principles of health promotion and community empowerment, as proposed by Nutbeam (1998) and Wallerstein (2006), emphasizing that sustainable health improvement can only occur when individuals are empowered to make informed decisions about their well-being. The emergence of local health ambassadors and community-driven initiatives signifies a shift in social structure, where community members become agents of change in promoting collective health awareness.

The reflection from this program indicates that participatory education models are highly applicable for addressing public health issues in rural areas. Health promotion activities that combine knowledge transfer, skill development, and mentoring can effectively increase the community's capacity to prevent non-communicable diseases, particularly diabetes mellitus. Future programs are recommended to expand the scope of activities by involving schools, local health institutions, and family networks to strengthen long-term health behavior change.

Furthermore, collaboration between universities, health professionals, and local governments is crucial in sustaining and replicating similar community-based health promotion

models. Continuous monitoring, evaluation, and adaptation of the program are necessary to ensure its relevance and effectiveness in diverse social contexts. Ultimately, the experience gained from this program contributes to the theoretical and practical development of community empowerment strategies in preventive health promotion.

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