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PREDIABETES RISK FACTOR CONTROL EDUCATION AT THE MUGI ELDERLY POSYANDU IS HEALTHY, DUKUHWALUH VILLAGE

EDUKASI PENGENDALIAN FAKTOR RISIKO PREDIABETES DI POSYANDU LANSIA MUGI SEHAT DESA DUKUHWALUH

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Abstract

Diabetes Mellitus (DM) is a condition when the body is unable to produce or use insulin effectively, resulting in increased glucose levels in the blood. Before the onset of type 2 DM, it is important to pay attention to the condition of prediabetes. As one of the global health problems, DM can be prevented through proper education and regular monitoring of fasting blood sugar levels. This service aims to identify fasting blood sugar and evaluate the effectiveness of education in increasing knowledge in the elderly. The method used is health education through lectures and interactive discussions at the Mugi Sehat Elderly Posyandu, Dukuhwaluh Village. The results of the activity showed that some of the results of the fasting blood sugar test were within the normal limit. The provision of education was proven to increase the level of understanding of respondents, which was shown by an increase in knowledge scores from the average pre-test of 70.31 to 86.93 in the post-test after the intervention. In conclusion, health education plays an important role in increasing the awareness of the elderly about controlling prediabetes risk factors to prevent the development of diabetes.

Keywords : Education, Fasting Blood Sugar, Prediabetes

Abstrak

Diabetes Mellitus (DM) merupakan kondisi ketika tubuh tidak mampu memproduksi atau menggunakan insulin secara efektif, yang menyebabkan peningkatan kadar glukosa dalam darah. Sebelum terjadinya DM tipe 2, penting untuk memperhatikan kondisi predaibetes.

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Sebagai salah satu masalah kesehatan global, DM dapat dicegah melalui edukasi yang tepat serta pemantauan kadar gula darah puasa secara rutin. Pengabdian ini bertujuan untuk mengidentifikasi gula darah puasa serta mengevaluasi efektivitas edukasi dalam meningkatkan pengetahuan pada lansia. Metode yang digunakan adalah pendidikan kesehatan melalui ceramah dan diskusi interaktif di Posyandu Lansia Mugi Sehat, Desa Dukuhwaluh. Hasil kegiatan menunjukkan bahwa sebagian hasil pemeriksaan gula darah puasa berada dalam batas normal. Pemberian edukasi terbukti meningkatkan tingkat pemahaman responden, yang ditunjukkan dengan peningkatan skor pengetahuan dari rata-rata *pre-test* 70,31 menjadi 86,93 pada *post-test* setelah intervensi. Kesimpulannya, edukasi kesehatan berperan penting dalam meningkatkan kesadaran lansia mengenai pengendalian faktor risiko prediabetes guna mencegah perkembangan menjadi diabetes.

Kata Kunci : Edukasi, Gula Darah Puasa, Prediabetes

1. INTRODUCTION

Diabetes Mellitus (DM) is a condition in which the body experiences difficulty in producing or effectively using insulin, leading to increased blood glucose levels. Poor lifestyle habits contribute to the development of DM, as an unhealthy lifestyle can trigger type 2 DM, which may subsequently lead to decreased productivity, the onset of disabilities, and an increased risk of mortality. Prediabetic conditions require attention before progressing to type 2 DM (Khasanah et al., 2022).

The American Diabetes Association (ADA) and the Department of Health and Human Services (DHHS) first introduced the term prediabetes (Astuti, 2019). Prediabetes is a condition that marks the early stage before diabetes occurs and increases the risk of developing the disease. It is also referred to as intermediate hyperglycemia or non-diabetic hyperglycemia. Prediabetes includes conditions characterized by Impaired Fasting Glucose (IFG), Impaired Glucose Tolerance (IGT), or a combination of both.

According to the World Health Organization (WHO, 2023), diabetes caused 1.5 million deaths in 2019, with 48% occurring before the age of 70. The 2018 Basic Health Research (RisKesDas) recorded an increase in the prevalence of Diabetes Mellitus (DM) to 2%, up from 1.5% in 2013 (Persadia & Perkeni, 2020). In Central Java, there were 624,082 DM cases (Dinkes Provinsi Jawa Tengah, 2023), while in Banyumas Regency, 23,388 individuals were recorded as DM patients, ranking it 6th out of 35 regencies/cities in Central Java (Dinkes Kabupaten Banyumas, 2023)

Efforts to reduce the incidence of diabetes and prediabetes require an understanding of prediabetes risk factors, which play a crucial role in preventing diabetes and improving public health. Aging is strongly associated with the occurrence of prediabetes. As individuals grow older, organ function gradually declines, and metabolism slows down (Liberty et al., 2022). Research by Madsen Beau De Rochars et al., (2021) found a correlation between older age and permanent residency status with an increased risk of diabetes. These findings are interconnected because age affects various aspects of health, such as immune system function, metabolism, and response to treatment. Therefore, the researchers found that the data generated showed a consistent pattern, in which certain age groups had a higher risk of specific diseases compared to other age groups.

Proper management of prediabetes and diabetes mellitus also helps prevent or control the occurrence of complications related to the disease. The management of diabetes mellitus can

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be categorized into five main pillars: education, physical activity, dietary patterns, self-monitoring of blood glucose, and pharmacological treatment (Prawinda et al., 2024).

The primary foundation for the treatment and prevention of Diabetes Mellitus (DM) is education (Muhlishoh et al., 2021). Education is an ongoing process that requires continuous monitoring of its progress. The main goal of health education is to enhance knowledge about prediabetes and diabetes mellitus. Efforts to improve motivation and provide comprehensive education are crucial for successfully achieving behavioral changes (Windani et al., 2018).

For every individual, early detection of major health issues, particularly non-communicable diseases, is essential. One of the key steps to support individuals is early detection or initial screening of a disease. Through early screening, individuals can determine whether their blood sugar levels fall within the high-risk category or the prediabetes range. This identification serves as a warning, allowing for early medical intervention to reduce risks and prevent more severe complications (Putri et al., 2023).

Education and early screening play a vital role in preventing and controlling prediabetes and diabetes. Proper education provides crucial information about prediabetes as a high-risk condition for diabetes. Education also plays an essential role in increasing awareness of the importance of maintaining a healthy lifestyle, adopting a balanced diet, and engaging in regular physical activity. Additionally, at-risk individuals can monitor their blood sugar levels through initial examinations to determine whether they fall into the high-risk category or the prediabetes range. This step serves as an early warning and enables faster medical intervention to mitigate risks and prevent serious complications (Hendrawan et al., 2023).

A lack of knowledge and awareness regarding education and early detection leads many individuals to overlook the early symptoms and risks of diabetes. As a result, prediabetes and diabetes often go undiagnosed or are only detected after complications have occurred, preventing optimal treatment in the early stages (Erika, 2023).

2. RESEARCH METHOD

The community service activity for the elderly at Posyandu Lansia Mugi Sehat in Dukuhwaluh Village aimed to identify risk factors using a questionnaire-based approach, combined with lectures and discussions. The activity was conducted in three stages: preparation, implementation, and evaluation. During the preparation stage, all necessary materials were arranged, including knowledge questionnaires, leaflets, presentation slides, and pre-test and post-test sheets. The implementation stage involved data collection with the help of enumerators, consisting of 10 nursing students and 5 community health cadres during the first session, and 6 students and 5 cadres in the following session. The enumerators assisted in administering knowledge questionnaires and conducting fasting blood sugar tests. They were not only responsible for supervising but also actively helping respondents understand and complete the questionnaires accurately, ensuring data reliability. To facilitate identification, each respondent was assigned a unique number from 1 to 45. The final stage, evaluation, assessed the participants' knowledge levels in the first session, as well as fasting blood sugar levels in both the first and second sessions.

3. RESULTS AND DISCUSSION

The community service activity at Posyandu Lansia Mugi Sehat was conducted in person, involving face-to-face interactions with the elderly. The implementation of this community service program took place over two sessions, held on October 27, 2024, and November 9,

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2024. Health education on prediabetes, including its etiology, risk factors, signs and symptoms, as well as preventive measures, was delivered through a 40-minute lecture using leaflet and PowerPoint media. The lecture method was chosen because it is considered effective and easily understood by the respondents. To assess the elderly's level of knowledge, pre-test and post-test evaluations were conducted. Additionally, blood glucose levels were measured using a fasting blood glucose test after an 8–12 hour fasting period. The details of the community service activities are as follows :

1. **First Session**

   The first session was held on October 27, 2024, at Al-Abror Mosque, Dukuhwaluh Village. The activity received a positive response and high enthusiasm from the elderly participants. Their enthusiasm was evident from the full attendance—all 45 invited participants attended the event, as per the invitations distributed by the community health cadres.

   The implementation team departed from Harapan Bangsa University at 07:00 AM WIB and arrived at Al-Abror Mosque at 07:15 AM WIB. Upon arrival, the team prepared for the community service activities. The event officially began at 08:00 AM WIB with a health screening, specifically a fasting blood sugar test. This was followed by a pre-test session, after which a health education session started at 10:15 AM WIB. The activity concluded with a post-test.

   The community service program aimed to identify prediabetes risk factors and educate the elderly on managing these risks. The activities were carried out in a structured manner, ensuring a comprehensive approach to health promotion. The program began with fasting blood sugar testing, allowing participants to assess their glucose levels and identify potential risks. This was followed by a pre-test to evaluate their initial knowledge of prediabetes. The health education session, conducted through lectures, provided essential information on prediabetes prevention and management, emphasizing healthy lifestyle choices, balanced nutrition, and regular physical activity. After the session, a post-test was administered to measure knowledge improvement among participants. Additionally, educational materials were distributed to reinforce the key messages and provide ongoing guidance. By implementing this structured approach, the program effectively facilitated knowledge transfer and awareness, empowering the elderly to take proactive steps in managing their health and reducing their risk of developing diabetes.

2. **Second Session**

   The second session was held on November 9, 2024, at Al-Abror Mosque, Dukuhwaluh Village. The number of participants remained the same as in the first session, with 45 elderly individuals attending. The session took place from 08:00 AM to 11:00 AM WIB, beginning with participant registration, followed by fasting blood sugar testing. The implementation of this session was designed to be efficient and well-structured. Participants who had completed the blood sugar screening immediately received a souvenir as a token of appreciation and were then allowed to leave. The activity proceeded smoothly and in accordance with established procedures, ensuring an organized and effective process.

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Figure 1 Documentation of Community Service Activities

a. Health Education

Successful health education can be observed through an increase in knowledge levels after the educational session. Knowledge assessment was conducted using a multiple-choice questionnaire consisting of 25 questions, with elderly participants given 30 minutes to complete it. A pre-test was conducted at the beginning of the session to measure the participants' knowledge levels before receiving health education. The pre-test results from 45 elderly participants showed an average score of 70.31, with the highest score reaching 84 and the lowest 52.

The session continued with educational material on prediabetes risk factor management, covering topics such as the definition of prediabetes, signs and symptoms, causes, risk factors, complications, and management strategies. The education session lasted 45 minutes and was delivered using a lecture method with PowerPoint slides as the primary teaching medium. After the presentation, a discussion session was held, followed by a post-test using the same questionnaire as the pre-test. The post-test results from 45 elderly participants showed an average score of 86.93, with the highest score reaching 100 and the lowest 76.

A comparison of the pre-test and post-test results, evaluating the elderly participants' knowledge levels on prediabetes risk factor management, is presented in Figure 2 below.

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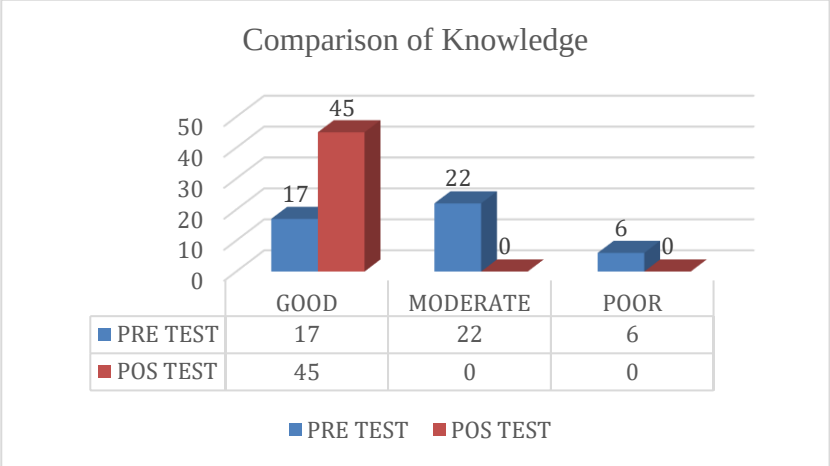

Figure 2 Comparison of Pre-Test and Post-Test Scores

Figure 2 illustrates a significant increase in the knowledge level of elderly participants after receiving health education intervention. Before the intervention, only 17 participants fell into the "Good" knowledge category. However, this number sharply increased to 45 participants after the intervention. Conversely, in the "Fair" category, there were initially 22 participants, but after the health education session, this number decreased to zero. A similar trend was observed in the "Poor" category, where 6 participants were initially recorded, but this number also dropped to zero after the intervention.

The health education session was delivered through a 40-minute lecture method. This method was chosen as it is considered an effective and easily comprehensible approach for the respondents. Not only was it well-received, but it was also well understood by the participants. The use of effective media facilitates the rapid reception of information (Romadhon et al., 2024). Educators are expected to utilize media as a tool to ensure that the conveyed information is well received by the respondents. In this community service program at the elderly health post (Posyandu), PowerPoint presentations and leaflets were used as educational media. Additionally, the short interval between the pre-test and post-test, which were conducted on the same day, contributed to the observed improvement in knowledge. The elderly participants were able to retain most of the newly presented material, allowing them to answer the post-test questions more accurately. These factors collectively indicate that an interactive, simple, and tailored educational approach can effectively enhance knowledge among the elderly.

Through this community service initiative, appropriate education has successfully increased respondents' awareness of the importance of early screening and prediabetes prevention efforts. The information provided is expected to help respondents better understand the significance of adopting a healthy lifestyle to reduce disease risks. Furthermore, improved knowledge about dietary habits and regular blood sugar monitoring will support efforts in preventing and managing prediabetes.

b. Fasting Blood Sugar

1) Fasting Blood Sugar First Session

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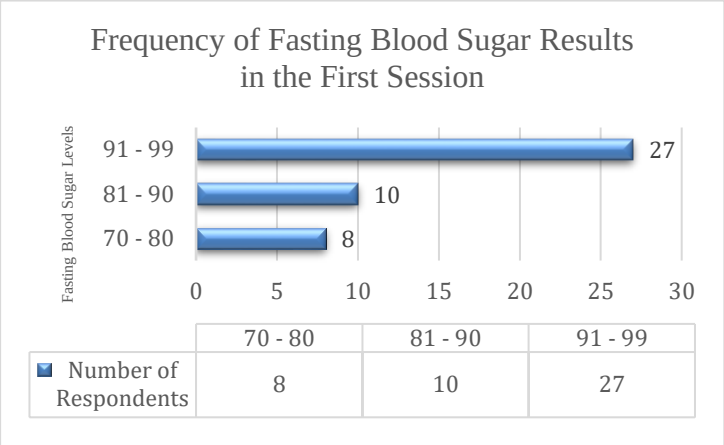

Figure 3 Fasting Blood Sugar Results in the First Session

2) Fasting Blood Sugar Second Session

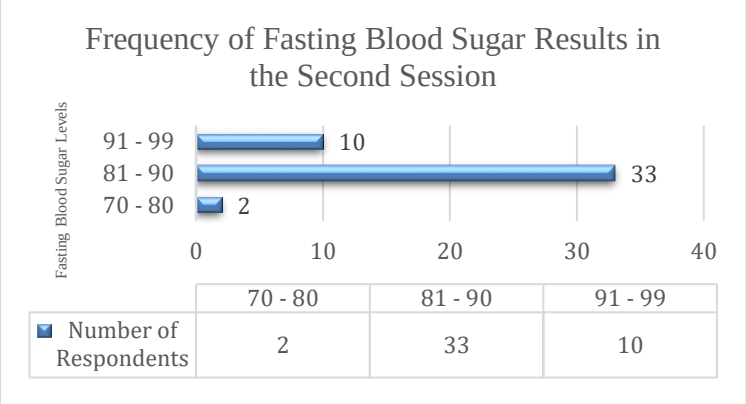

Figure 4 Fasting Blood Sugar Results in the Second Session

During the first and second sessions, fasting blood sugar (FBS) levels were measured for all participants. The results indicated that all participants had blood sugar levels within the normal range, although variations in fasting blood sugar levels were observed between the first and second sessions. However, no participants were classified as prediabetic or diabetic, suggesting that their metabolic condition was generally in good health. Changes in FBS values over time indicate that the participants' bodies are still functioning well. Factors such as dietary patterns, physical activity, and the timing of sample collection may influence these fluctuations.

Health monitoring, particularly regarding blood sugar levels, is crucial. Fasting Blood Sugar (FBS) is one of the screening methods used to detect diabetes mellitus or prediabetes (Hasanah & Ikawati, Apt., 2021). The normal range for FBS typically falls between 70 and 99 mg/dL, while prediabetes is defined as levels between 100 and 125 mg/dL. Based on the results of the community service program, which included FBS testing in both sessions, all respondents demonstrated blood sugar levels within the normal category. This indicates that their blood glucose levels remain well-maintained. It is essential to understand that prediabetes is defined as a condition in which fasting blood sugar levels exceed the

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normal threshold but have not yet reached the criteria for diabetes mellitus. In the context of this study, all respondents had fasting blood sugar levels within the normal range, meaning they cannot be clinically classified as individuals with prediabetes.

4. CONCLUSION

Health education and counseling are effective in enhancing respondents' knowledge and understanding of prediabetes risk factor management. This improvement also indicates that the provided health education can have a positive impact in promoting healthy behaviors and preventing the risk of prediabetes from progressing to diabetes mellitus.

Several recommendations emerged from this activity, directed at the elderly, Posyandu partners, educational institutions, and future researchers. The elderly are encouraged to maintain a healthy diet, engage in regular light physical activity, and routinely monitor their blood glucose levels. Posyandu is expected to continue supporting elderly health monitoring, including regular prediabetes risk screenings. The outcomes of this program may serve as valuable reference material for educational institutions in preparing health students, particularly in nursing, to fulfill their community roles effectively. Future researchers should ensure respondent compliance with the 8 to 12-hour fasting requirement prior to blood glucose testing to enhance result accuracy, and are encouraged to broaden the educational content to cover more comprehensive aspects of prediabetes prevention and management.

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