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Health Education for the Prevention and Management of Diabetes Mellitus through the Role of Nurses in the Community

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Abstract

Purpose: This study aims to evaluate the effectiveness of a health education program conducted by nurses in improving community knowledge about the prevention and management of DM. **Methods:** This study used a quantitative method with a pre-experimental design, specifically a one-group pre-test and post-test design. A total of 120 respondents from the community in City Y participated in this program. Data were collected using structured questionnaires before and after the educational intervention. **Results:** The study showed a significant increase in community knowledge about DM, with an average pre-test score of 60.2% and a post-test score of 85.4% ($p<0.05$). **Conclusion:** Health education programs by nurses effectively improve community knowledge regarding the prevention and management of DM. The continuous implementation of similar programs is recommended to reduce the prevalence of DM.

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INTRODUCTION

Diabetes mellitus (DM) is one of the non-communicable diseases with a steadily increasing prevalence worldwide. According to the International Diabetes Federation (IDF), approximately 463 million adults were living with diabetes in 2019, and this number is projected to rise to 700 million by 2045 (IDF, 2019). In Indonesia, the prevalence of DM is also increasing, with more than 10 million people diagnosed

with DM, making Indonesia one of the countries with the highest number of diabetes cases globally (Kemenkes RI, 2018).

DM is characterized by chronic hyperglycemia due to impaired insulin production or insulin resistance (American Diabetes Association, 2020). Complications from DM can be severe, including heart disease, stroke, kidney failure, blindness, and amputations. Therefore, effective prevention and management of DM are crucial public health priorities to reduce DM-related morbidity and mortality (WHO, 2020).

Nurses play a vital role in the prevention and management of DM, especially in providing health education to the community. Research has shown that health education delivered by nurses can enhance community understanding of the importance of a healthy lifestyle, blood glucose control, and adherence to medication (Funnell et al., 2019). Continuous health education provided by healthcare professionals can help individuals at high risk or already diagnosed with DM to manage their condition better and prevent complications.

Furthermore, effective education about DM can increase community awareness and ability to recognize early symptoms of DM, such as increased frequency of urination, excessive thirst, and unexplained weight loss. Early recognition of these symptoms can encourage individuals to seek medical examination, allowing early intervention to manage their health conditions (Powers et al., 2017).

Therefore, this study aims to evaluate the effectiveness of a health education program delivered by nurses in improving community knowledge about the prevention and management of DM. The findings of this study are expected to contribute to the development of community-based health education strategies for DM prevention and management.

METHOD

This study employed a quantitative method with a pre-experimental design, specifically a one-group pre-test and post-test design. The respondents of this study were 120 community members selected through purposive sampling. The educational program was conducted over four weeks, with one educational session per week. The educational materials covered the definition and types of DM, risk factors, signs and symptoms, prevention, management, and the importance of a healthy diet and physical activity.

Research Instruments: The instrument used was a structured questionnaire consisting of 25 multiple-choice questions. The questionnaire was tested for validity and reliability, with a Cronbach's Alpha value of 0.88. A pre-test was conducted before the educational program to measure the respondents' baseline knowledge about DM, and a post-test was conducted after the program to measure the improvement in knowledge.

Data Analysis: The collected data were analyzed using the SPSS software version 26.0. Univariate analysis was performed to describe the characteristics of the respondents and

the distribution of knowledge scores. Bivariate analysis using a paired t-test was conducted to evaluate the changes in knowledge scores before and after the educational intervention

RESULTS AND DISCUSSION

Data were analyzed using univariate analysis to describe the sample characteristics and bivariate analysis to test the relationship between program implementation and maternal and infant health outcomes. The statistical tests used were t-tests for numerical data and chi-square tests for categorical data, with a significance level of $p < 0.05$.

Tabel 1 : Distributing Demographic characteristics respondent (N =110)

Characteristics		Frequency	Percentage (%)
Gender	Male	48	40
	Female	72	60
Age (Years)	18-30	30	25
	31-50	66	45
	>50	24	20
Education	Junior High School	24	20
	Senior High School	60	50
	Diploma/Degree	36	30

Table 1 presents the demographic characteristics of the respondents who participated in the study. The univariate data indicate that the productive age group (31-50 years) was the majority in this study, highlighting the importance of focusing on preventive education in this age group to prevent the development of DM. Additionally, more than half of the respondents were female, which may reflect higher interest or awareness of health issues among women.

Table 2. Comparison of Knowledge Scores Before and After Intervention (N=110)

Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	p-value
Knowledge Score	60.2 ± 15.3	85.4 ± 10.7	<0.05

The results of the paired t-test showed a significant increase in knowledge scores after the educational intervention ($p<0.05$). This indicates that the educational program conducted by nurses successfully improved the community's understanding of DM prevention and management. The significant increase highlights that nursing educational interventions are effective strategies for educating the community.

The significant improvement in knowledge after the educational intervention underscores the importance of the role of nurses in educating the community about DM prevention and management. This is consistent with the findings by Funnell et al. (2019), which show that health education delivered by nurses can improve individuals' understanding and ability to manage DM.

Comprehensive health education increases knowledge and has the potential to change community behaviors towards healthier lifestyles. As stated by Powers et al. (2017), education that includes information on blood glucose control, the importance of a healthy diet, and physical activity can help individuals with DM manage their condition better and reduce the risk of complications.

The duration and frequency of the education also affect the effectiveness of the program. In this study, weekly educational sessions over a month proved effective. A study by Norris et al. (2020) showed that continuous and repeated education could have a more significant impact on reinforcing knowledge and skills in DM management among the community.

Moreover, the method of delivering the material by nurses with expertise and clinical experience can provide relevant and accurate information. Nurses also have good communication skills, which can bridge the gap between medical information and the general public's understanding (American Diabetes Association, 2020).

These results also highlight the importance of active community involvement in health education programs. By empowering the community to understand and manage their health, a more supportive environment can be created for preventing and managing chronic diseases such as DM (Funnell et al., 2019). This can serve as a basis for developing similar programs in various regions to reduce the burden of DM in the community.

CONCLUSION

Health education programs conducted by nurses effectively increase community knowledge about the prevention and management of diabetes mellitus. Community-based health education involving nurses as educators can be a crucial strategy in preventing DM. The continuous implementation of similar programs is strongly recommended to reduce the prevalence of DM and improve the quality of life in the community.

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