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INTRODUCTION TO DIABETES MELLITUS RISK FACTORS AS AN EARLY PREVENTION EFFORT AND UNDERSTANDING OF DIABETES AT ARROHYATI ORPHANAGE SURABAYA

Choirotussanijjah^{1*}, Renny Novi Puspitasari¹, Ratna Sofaria Munir¹,
Muh. Nabil¹, Nesha Cantika Amalia¹, Malva Rania Jasmine¹

¹ Universitas Nahdlatul Ulama Surabaya

* Correspondence

Choirotussanijjah

Universitas Nahdlatul Ulama Surabaya

Jl. Raya Jemursari No. 51-57 Surabaya, Jawa Timur, Indonesia

Email: choirotussanijjah.dr@unusa.ac.id

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ABSTRACT

Diabetes mellitus is a chronic metabolic disease whose prevalence continues to rise globally, including in Indonesia, and is often triggered by unhealthy lifestyle habits starting from a young age. Early prevention efforts through education about risk factors are crucial to reducing future incidence. This community service activity aimed to improve the knowledge of children and adolescents at Arrohyati Orphanage regarding diabetes mellitus risk factors. The method used was health education delivered through interactive lectures, discussions, and Q&A sessions. Knowledge evaluation was conducted through pre-test and post-test assessments. There were 16 participants with diverse characteristics, consisting of 9 females and 7 males, aged 6–18 years, with educational levels ranging from kindergarten to senior high school. The results showed an improvement in participants' understanding after the educational intervention. In the pre- test, 7 participants were categorized as having good knowledge, 4 were in the fair category, and 5 were in the poor category. After the educational session, the number of participants with good knowledge increased to 9, while fair and poor categories decreased to 3 and 4, respectively. These findings indicate a positive shift towards better understanding. The discussion confirms that health education significantly contributes to improving knowledge among children and adolescents, although repetition and environmental support are required to sustain the outcomes. In conclusion, education on diabetes mellitus risk factors effectively enhanced participants' understanding, and follow-up actions such as monitoring and caregiver involvement are needed to reinforce healthy lifestyle practices.

Keywords: Diabetes Mellitus; Early Prevention; Health Education; Risk Factors.

INTRODUCTION

One of the major global health concerns is diabetes mellitus (DM), which is recognized as a leading cause of morbidity and mortality worldwide (Hossain et al., 2024). The prevalence of DM has continued to increase significantly, with an estimated 19 million Indonesians affected by diabetes in 2021, and this number is projected to grow in the coming years (IDF, 2021). The increasing incidence of diabetes is closely associated with lifestyle changes, including high consumption of sugar and fat, as well as low levels of physical activity (Sun et al., 2022). Diabetes mellitus not only affects individuals' quality of life but also imposes significant economic and social burdens. Its complications include retinopathy, nephropathy, neuropathy, and cardiovascular diseases (ADA, 2023). Early prevention through health education and screening plays a crucial role in reducing both the risk of diabetes and its complications (Zhou et al., 2021).

Orphanages with school-aged children are a strategic target for diabetes education, considering that healthy lifestyle habits should be introduced early in life. Knowledge of risk factors, including unhealthy diet, lack of physical activity, and sedentary behavior, can help children make wiser dietary choices and adopt healthy lifestyles (Fitria & Sari, 2020). In addition, the free health screening conducted as part of the community service program also served as early detection of non-communicable disease risks among the children and caregivers.

Arrohyati Orphanage, located at Jl. Kedurus 4 Gang Jambu No. 2, Surabaya, is a social institution that supports orphans and underprivileged children, totaling 16 individuals currently pursuing education from elementary to senior high school. While the orphanage has previously received visits from various institutions, based on interviews, it has not yet hosted health-focused activities. This is particularly important as health is a fundamental aspect supporting children's growth and development, especially among school-aged children prone to communicable and non-communicable diseases.

Therefore, the implementation of a community service activity at Arrohyati Orphanage focusing on diabetes mellitus education, risk factors, complications, and free health screening was a relevant and necessary initiative to enhance awareness and preventive efforts against this chronic disease.

OBJECTIVES

General Purpose

To increase knowledge and awareness of children and adolescents at Arrohyati Orphanage regarding diabetes mellitus, particularly the understanding of its risk factors, symptoms, complications, and early prevention strategies through health education.

Special Purpose

To introduce the concept of diabetes mellitus, including its definition, causes, symptoms, and potential complications.

1. To educate participants about lifestyle-related risk factors such as unhealthy eating habits, lack of physical activity, and sedentary lifestyle.
2. To evaluate the improvement in participants' understanding using pre-test and post-test assessment methods.
3. To encourage the adoption of healthy behaviors as an early preventive strategy against diabetes mellitus.
4. To engage caregivers in supporting and reinforcing healthy lifestyle practices among children in the orphanage.

PLAN OF ACTION

Strategy Plan

This program adopted a participatory and practical health education strategy aimed at increasing knowledge regarding diabetes mellitus. The approach focused on early prevention through interactive learning, including lectures, discussions, and knowledge assessments. Educational content covered the definition of diabetes mellitus, risk factors, symptoms, and complications, designed to improve awareness and promote healthy habits.

Implementation

The program began with an introductory session using PowerPoint-based presentations tailored to various age levels. Interactive lectures were delivered to simplify complex medical information. Engagement was enhanced through question-and-answer sessions and educational mini-quizzes to encourage active participation. Knowledge evaluation was conducted using pre-test before the educational session and post-test afterward, categorized into good (76-100%), fair (56-75%), and poor ($\leq 55\%$) based on Arikunto (2013).

Setting

The activity took place at Arrohyati Orphanage, located in Surabaya, serving as a community-based environment that fosters the learning process. The orphanage provided a conducive setting for informal health education, allowing both children and caregivers to be actively involved in the program.

Target

The primary target participants were children and adolescents aged 6–18 years, ranging from elementary to senior high school levels, along with caregivers. The program aimed to improve their knowledge and awareness of diabetes mellitus and encourage the adoption of healthy lifestyle practices as an early prevention effort.

RESULTS AND DISCUSSION

The community service activity titled “Introduction to Diabetes Mellitus Risk Factors as an Early Prevention Effort and Understanding of Diabetes” was successfully carried out at Arrohyati Orphanage with 16 participants. They consisted of 9 females and 7 males aged 6-18 years. Their educational levels varied: 1 kindergarten student, 6 elementary school students, 5 junior high school students, and 4 senior high school or vocational students. This diversity posed challenges in delivering material, especially since the participants' initial knowledge about diabetes mellitus was very limited. The characteristics of the participants are presented in Table 1.

The pre-test results showed that 5 participants were categorized as poor ($\leq 55\%$), indicating insufficient knowledge of diabetes mellitus risk factors. Four participants were in the fair category (56-

75%), meaning they had basic but limited understanding. Meanwhile, 7 participants were in the good category (76-100%), which indicated adequate prior knowledge. Overall, the pre-test results demonstrated that participants' baseline understanding was relatively low and needed improvement, especially among younger participants with lower educational levels.

After the educational session, participants demonstrated improved knowledge. The number of participants in the good category increased to 9, while the fair and poor categories decreased to 3 and 4, respectively. This indicates a positive shift in understanding following the educational intervention.

Table 1. Characteristic of Participants

Characteristic	n	f (%)	Mean (years)
Age			12.5
Gender			
Male	7	43.75	
Female	9	56.25	
Education Level			
Kidergarten	1	6.25	
Elementary School	6	37.5	
Junior High School	5	31.25	
Senior High School/Vocational	4	25	

Understanding diabetes risk factors from an early age is vital, given that lifestyle changes in children and adolescents greatly influence the prevention of chronic diseases later in life (WHO, 2022). Education in orphanages holds strategic value, as children tend to mimic behaviors from caregivers and peers. Providing the right knowledge is expected to help them implement healthy behaviors such as reducing sugar consumption, increasing physical activity, and maintaining ideal body weight.

The increase in post-test scores confirmed the effectiveness of health education in improving participants' understanding of diabetes mellitus risk factors. This aligns with Notoatmodjo (2012), who explained that knowledge is a fundamental domain in health behavior change and can be enhanced through proper health education. This finding is also consistent with the study by Wahyuni et al. (2020), which demonstrated that game-based and group discussion health education is effective in improving children's knowledge of chronic diseases.

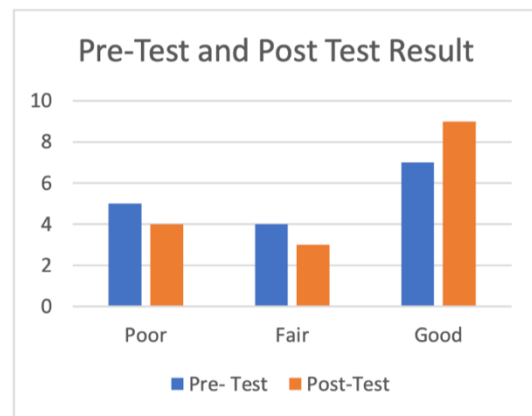


Figure 1. Pre- and Post-Education Knowledge Comparison on Diabetes Mellitus

However, participants with lower educational levels (kindergarten and elementary school) still faced challenges in grasping medical terminology; thus, using simpler and more visual-based approaches, such as posters or simulations, would be beneficial.

In addition to age and education, motivation also plays a role in the successful improvement of knowledge. Green and Kreuter (2005) emphasized that behavior change is influenced not only by knowledge, but also by predisposing factors (age, education, motivation), enabling factors (available facilities), and reinforcing factors (caregiver and environmental support). Therefore, follow-

up involving orphanage caregivers is crucial to help children sustain healthy lifestyle habits.



Figure 2. Community Outreach Program on Diabetes Mellitus Introduction at Arrohyati Orphanage, Surabaya

The results of this activity indicate that the diabetes mellitus risk factor awareness program at Arrohyati Orphanage successfully improved the participants' knowledge. However, follow-up strategies such as ongoing monitoring, repeated education, and the integration of healthy behaviors into daily activities at the orphanage are still needed. Through these efforts, early prevention of diabetes mellitus can be carried out sustainably, enabling the children at the orphanage to grow with healthier lifestyle habits.

CONCLUSION

The community service program on diabetes mellitus risk factors at Arrohyati Orphanage successfully improved participants' knowledge. There was an increase in the number of participants in the good knowledge category after the educational intervention, while those in the fair and poor categories declined. This indicates that the educational program effectively enhanced the understanding of diabetes prevention among children and adolescents.

However, a small number of participants still showed inadequate understanding, thus requiring follow-up actions such as repeated education, the use of more varied learning methods, and active involvement of caregivers to sustain healthy behavior. Early education in orphanage settings is expected to become a strategic effort in reducing future diabetes incidence.

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