

THE EFFECT OF E-BOODIE (ELECTRONIC BOOKLET ON DIABETES) EDUCATION ON KNOWLEDGE OF DIABETES MELLITUS PREVENTION EFFORTS AT SMA NEGERI 5 JAMBI CITY

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ABSTRACT

Background: Diabetes Mellitus is a non-communicable disease with a globally increasing prevalence, including among adolescents. According to the World Health Organization (WHO) in 2024, there are 422 million diabetes cases worldwide, with 877,531 cases recorded in Indonesia. In Jambi City, Diabetes Mellitus has become a major public health issue, with 21,172 cases reported in 2022 (Jambi City Health Office). One of the contributing factors to the rising number of cases is unhealthy lifestyle habits, such as the consumption of foods high in sugar and fat.

Method: This study aims to determine the effect of education using E-BOODIE (Electronic Booklet on Diabetes) on students' knowledge regarding the prevention of Diabetes Mellitus at SMA Negeri 5 Jambi City. The study employed a quantitative method with a pre-experimental design (One Group Pretest-Posttest Design), involving 40 students as the sample.

Results: The research instrument was a questionnaire, and data were analyzed using a paired t-test. The results showed a significant increase in the average scores of students' knowledge and attitudes after being given education using the E-BOODIE media ($p < 0.05$), rising from 5.65 to 8.48.

Conclusion: These findings indicate that E-BOODIE is effective in enhancing students' understanding and awareness of Diabetes Mellitus prevention. Thus, E-BOODIE can serve as an innovative and interactive health education medium, particularly in improving adolescents' knowledge and attitudes toward early prevention of Diabetes Mellitus.

Keywords: Diabetes Mellitus, E-BOODIE, Health Education, Knowledge

INTRODUCTION

Diabetes Mellitus (DM) is a non-communicable disease with a globally increasing prevalence. According to WHO (2024), over 422 million people suffer from diabetes worldwide, causing 1.5 million deaths annually. The International Diabetes Federation (2022) projects this number to rise to 784 million by 2045, with nearly half of the cases undiagnosed.

In Indonesia, the 2023 Health Survey recorded 877,531 diagnosed cases of DM, with a significant rise among adolescents. Urban lifestyles and unhealthy dietary habits contribute to this increase, confirming Bowen & Rothman's (2010) findings that diabetes is becoming a major cause of morbidity among youth.

In Jambi Province, DM ranks among the top five public health issues, with Jambi City reporting the highest number—21,127 cases in 2022. This highlights the urgent need for effective prevention strategies targeting youth.

SMA Negeri 5 Jambi, located in the city center, provides students with easy access to high-sugar and high-fat foods. Most students come from middle to upper economic backgrounds and frequently consume fast food, increasing their risk of developing DM.

To address this, the researcher conducted an educational intervention using E-BOODIE (Electronic Booklet on Diabetes) to improve students' knowledge and attitudes toward DM prevention. The study is titled "The Effect of E-BOODIE Health Education on Knowledge of Diabetes Mellitus Prevention Among Students of SMA Negeri 5 Jambi City".

METHODS

This study is a quantitative research using a pre-experimental method with a one-group pretest - posttest design. It aims to determine the effect of health education using E-BOODIE (Electronic Booklet on Diabetes) on students' knowledge regarding the prevention of Diabetes Mellitus at SMA Negeri 5 Jambi City. The study was conducted from January to March 2025. This design does not include a control group but involves a pretest conducted prior to the intervention to assess changes following the treatment.

The study consists of two variables: an independent variable and a dependent variable. The independent variable is the health education using E-BOODIE, while the dependent variable is the students' level of knowledge about diabetes prevention.

The research instrument serves as a tool to collect, process, and interpret data obtained from 40 respondents using a consistent measurement approach. In this study, the instruments and materials used include the E-BOODIE as the educational media and a knowledge questionnaire on Diabetes Mellitus as the measurement tool.

RESULTS AND DISCUSSION

3.1. Respondent characteristics

Tabel 1 Distribusi Karakteristik Responden

Ages	Frequency	Percentage
16	24	60 %
17	16	40%
Total	440	1100%

Based on the table, the respondents in this study were adolescents aged between 16 and 17 years. The majority were 16 years old, totalling 24 individuals or 60% of the total respondents. Meanwhile, 16 respondents, or 40%, were 17 years old. These findings indicate that most of the respondents involved in the study were 16 years old.

Tabel 2. Frequency Distribution of Respondents' Gender

Gender	Frequency	Percentage
Male	9	22,5 %
Female	31	77.5%
Total	40	100%

Based on the data, the majority of respondents in this study were female, totalling 31 individuals or 77.5% of the total respondents. Meanwhile, the number of male respondents was 9 individuals or 22.5%. These results indicate that participation in this study was predominantly female.

3.2 Overview of the Average Knowledge Before and After Education on Diabetes Mellitus Prevention Among High School Students

Table 1. The Influence of E-BOODIE (Electronic Diabetes Booklet) on Knowledge of Diabetes Mellitus Prevention Efforts

Variable	N	Mean	SD	Min-Max	
Knowledge of Diabetes Prevention Efforts	40	Pre-Test	5,65	1.051	4-8
		Post-Test	8,48	847	7-10

Based on the table above, regarding the knowledge variable on Diabetes Mellitus prevention efforts, there is a significant difference between the knowledge scores before and after the E-BOODIE intervention. The average knowledge score before the intervention was 5.65 with a standard deviation of 1.051, while after the intervention, the average score increased to 8.48 with a standard deviation of 0.847. The mean difference between the pre-test and post-test scores was 2.83, with a p-value of 0.000, indicating that the difference is highly significant ($p < 0.05$). Therefore, it can be concluded that the use of E-BOODIE has a significant positive effect on improving knowledge about Diabetes Mellitus prevention efforts.

Based on the research conducted on 40 respondents aged 16–17 years at SMA Negeri 5 Kota Jambi, it was found that there was an increase in knowledge after being provided with educational media in the form of E-Boodie regarding the prevention of Diabetes Mellitus. Before the intervention, most respondents had low to moderate knowledge levels about

Diabetes Mellitus prevention. After the intervention, a significant improvement in the respondents' knowledge was observed.

This study aligns with the research conducted by Sheladjik & Yulianti (2023), which stated that E-Booklet media had an impact on knowledge about anemia prevention in adolescent girls at an MA in Kabupaten Bandung. Widuri et al. (2021) also mentioned that the use of e-booklets in health education can increase knowledge levels both before and after the intervention. Similar findings were obtained in a study by Kusumawati Y. (2021), which reported that the group receiving education through booklets had higher knowledge scores compared to the group that did not receive such education. Another study showed a significant increase in knowledge before and after the use of booklet media, with 100% of respondents falling into the "good" knowledge category (Yulianingsih E).

This demonstrates that educational interventions that are engaging and developmentally appropriate for adolescents can be an effective strategy for the prevention of non-communicable diseases in the future. This is evident in question P6, which discusses the common symptoms of Diabetes Mellitus. A significant increase in respondents' knowledge was observed after the E-Boodie intervention. Before the intervention, most respondents still lacked understanding of the early signs and symptoms of Diabetes Mellitus, such as frequent urination, excessive thirst, and unexplained weight loss. After the E-Boodie intervention, respondents' understanding of these general symptoms significantly improved.

During adolescence, lifestyle is greatly influenced by the surrounding environment, such as peers, family, and mass media. According to Soetjiningsih (2018), adolescence is a transitional phase from childhood to adulthood, marked by a growth spurt and psychological and cognitive changes. Optimal developmental achievement in adolescents largely depends on their biological potential, which is the result of the interaction between genetic and bio-psycho-social environmental factors. Several risk factors that can lead to chronic diseases in adolescents include stress,

obesity, and excessive nutrient intake (Agustina R.).

Overall, data analysis shows a significant difference in the average knowledge level before and after the E-Boodie intervention. This proves that providing education through E-Boodie media is effective in raising adolescents' awareness of the symptoms of Diabetes Mellitus and the importance of early prevention. The E-Boodie media, which contains visual information and simple text, is considered effective in strengthening memory and clarifying the respondents' understanding.

In this study, the improvement in knowledge and attitudes of respondents after receiving E-Boodie education can be explained through Albert Bandura's Social Cognitive Theory. According to Bandura (1986), individuals learn not only through direct experience but also through observation and interaction with their environment. This theory emphasizes the role of personal factors (such as self-belief), behavior, and the environment in shaping an individual's behavior and attitudes.

CONCLUSION

Health education provided through the E-BOODIE media serves as an environmental stimulus that influences respondents' knowledge and attitudes, in line with the concept of observational learning within Social Cognitive Theory. After receiving information through this medium, respondents were able to form new perceptions regarding the importance of Diabetes Mellitus prevention, as reflected in a positive shift in their attitudes.

Thus, E-BOODIE can be considered a practical, effective, and appropriate alternative health education medium for 16–17-year-old adolescents, helping to raise awareness and understanding of the importance of Diabetes Mellitus prevention.

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CONFLICT OF INTEREST

All authors state that there are no conflict of interest.

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