

FLIPBOOK HEALTH PROMOTION INCREASES ELDERLY PEOPLE'S KNOWLEDGE ABOUT DIABETES MELLITUS

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ABSTRACT

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Background: Lack of knowledge and awareness among people with diabetes mellitus increases the risk of complications. Adequate knowledge encourages individuals to understand information, thereby raising awareness of the importance of maintaining a healthy diet and physical activity. Prevention and control of diabetes mellitus can be achieved through health promotion. The purpose of this study was to determine the effect of health promotion using flipbooks on increasing knowledge about diabetes mellitus among older adults. Method: This study used a pre-experimental quantitative design with a one-group pre-post test. The population consisted of 108 elderly people with diabetes mellitus, with a sample of 85 people selected using simple random sampling. Data were collected through questionnaires and analyzed using the Wilcoxon test. Result: This study used the Wilcoxon test with a value of $\alpha = 0.05$, obtaining a p-value of 0.000, where $0.000 < 0.05$, so H_1 was accepted and H_0 was rejected, meaning that there was an effect of health promotion using flipbooks on knowledge about diabetes mellitus in the Merakurak Community Health Center Working Area. Conclusion: From the above description, it can be concluded that health promotion using flipbooks has an effect on knowledge about diabetes mellitus in the Merakurak Community Health Center Working Area. Based on the results of this study, it is hoped that elderly people with diabetes mellitus can improve their healthy lifestyle and gain broader knowledge about diabetes mellitus.

1. INTRODUCTION

Noncommunicable diseases (NCDs) are one of the main challenges in the field of health in Indonesia because their prevalence continues to increase, both globally and nationally, and they are among the ten leading causes of death¹. One of the NCDs with the highest number of

cases is diabetes mellitus, a chronic metabolic disorder characterized by an increase in blood glucose levels above normal limits².

Noncommunicable diseases (NCDs) are a major health problem with increasing prevalence and are among the ten leading causes of death. One of the NCDs with the

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highest number of cases is diabetes mellitus, a chronic metabolic disorder characterized by hyperglycemia due to insulin resistance. This condition is influenced by unhealthy lifestyles, such as consumption of fast food, fatty foods, low-fiber foods, lack of physical activity, and stress³.

According to data obtained from an organization called the International Diabetes Federation (IDF), an estimated 463 million people worldwide aged 20-79 are vulnerable to diabetes mellitus. Related sources say that in 2019, the prevalence rate was 9.3% of the world's population in the same age group⁴. In Indonesia, the number of people with diabetes mellitus continues to increase from 10.7 million in 2019 to 19.5 million in 2021. The estimated number of people with diabetes mellitus in East Java in 2019 was 841,994, and in 2020 it increased to around 875,745, continuing to increase in 2021 to around 929,810 (East Java Health Office, 2019-2021).

Data from the Tuban Community Health Center shows that the prevalence of diabetes mellitus increased by 670 people in 2019, 688 people in 2020, 726 people in 2021, and 730 people in 2022 (Tuban Community Health Center, 2019-2022). Meanwhile, the latest data obtained by the author from the Doromukti Village Midwife shows that there are 108 people with diabetes mellitus at the Doromukti Village Health Center. From the above data, it can be concluded that there has been a rapid increase in the number of people with diabetes mellitus due to a lack of knowledge about health.

Diabetes mellitus, commonly known as diabetes, is one of the health problems⁵. The danger of diabetes mellitus is that it cannot be cured and if not treated immediately, it will affect other aspects of health⁶. Symptoms of diabetes mellitus include excessive thirst,

frequent urination, and weight loss. Other symptoms may include weakness, tingling sensations, rapid hunger, itching, blurred vision, decreased sexual desire, and slow-healing wounds⁷. Prevention and control of diabetes mellitus in Indonesia are carried out so that healthy individuals remain healthy, people who already have risk factors can control those factors so they do not develop diabetes mellitus, and people who already have diabetes mellitus can control their disease so that complications or premature death do not occur⁸. The high number of diabetes mellitus patients is caused by irregular eating patterns, which play a significant role in the occurrence of diabetes mellitus. The more irregular the eating patterns, the more likely a person is to develop diabetes mellitus⁹.

Prevention and control of diabetes can be achieved through health promotion, education, early detection of risk factors, and management according to standards (Indonesian Ministry of Health, 2020). Health promotion plays an important role in increasing public knowledge about diabetes mellitus, especially regarding diet and physical activity. In this study, researchers developed an educational medium in the form of a flipbook designed according to the needs of the target audience¹⁰. The use of animated images in the flipbook helps facilitate understanding of the information and improves individuals' skills in utilizing digital technology¹¹.

Based on this background, the researcher was interested in conducting a study entitled "Flipbook Health Promotion to Increase Elderly People's Knowledge about Diabetes Mellitus."

2. METODE

This study used a pre-experimental design with a one group pre-test post-test approach to determine the effect of health

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promotion using Flipbook media on knowledge about diabetes mellitus among elderly people in the Tuban Community Health Center working area. The study population consisted of all elderly people with diabetes mellitus in Doromukti Village, totaling 108 people, with a sample of 85 respondents determined using the Slovin formula and simple random sampling technique. The intervention provided was health promotion through Flipbook media containing information about the definition, symptoms, causes, and prevention of diabetes mellitus. Data collection was conducted using a closed questionnaire consisting of 15 questions to measure the respondents' knowledge before and after the intervention. Knowledge categories were divided into good (76–100%), adequate (56–75%), and poor ($\leq 55\%$). The instrument was tested with a minimum calculated validity of $0.433 > \text{table } r \text{ of } 0.334$ and Cronbach's Alpha reliability of 0.813 , thus declared valid and reliable. Data analysis used the Wilcoxon Signed Rank Test with the help of SPSS at a significance level of 0.05 to determine the difference in knowledge levels before and after health promotion with the Flipbook media.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Respondents

Characteristics	N	%
Age		
Middle-aged 45-59 years old	51	60
Elderly 60-74 years old	33	38,8
Old 75-90 years old	1	1,2
Gender		
Male	20	23,5
Female	65	76,5
Knowledge of Diabetes Mellitus Before Promotion		
Good	7	8,2

Characteristics	N	%
Fair	35	41,2
Less	43	50,6
Knowledge of Diabetes Mellitus After Promotion		
Good	51	60
Fair	29	34,1
Less	5	5,9

Based on Table 1, it was found that after receiving health promotion through flipbooks, 85 (100%) respondents were elderly women with diabetes mellitus, totaling 65 (76.5%) respondents. Almost all of the respondents were elderly women with diabetes mellitus, totaling 65 (76.5%) respondents. Most respondents had a low level of knowledge about diabetes mellitus, totaling 43 (50.6%) respondents, while most respondents had a good level of knowledge about diabetes mellitus, totaling 51 (60%) respondents.

Table 2. Analysis of the effect of health promotion using flipbooks on knowledge about diabetes mellitus among the elderly

Health Promotion Using Flipbook Media	Knowledge of Diabetes Mellitus			Total
	Good	Fair	Less	
<i>Pre-Test</i>	7 (8,2%)	35 (41,2%)	43 (50,6%)	85 (100%)
<i>Post-Test</i>	51 (60%)	29 (34,1%)	5 (5,9%)	85 (100%)
<i>Wilcoxon Signed Rank Asymp.Sig (2 Failed) = 0,000</i>				

Table 2 shows that of the 85 (100%) respondents, before the health promotion using flipbooks, most elderly people had poor knowledge of diabetes mellitus, namely 43 (50.6%) respondents, whereas after the health promotion using flipbooks, the respondents experienced a change in behavior, with most of them having good knowledge of diabetes mellitus, namely 51 (60%) respondents.

Level of knowledge about diabetes mellitus among the elderly before being given health promotion through flipbooks

The results showed that before being given health promotion using flipbooks, most elderly people with diabetes mellitus in Doremukti Tuban Village had insufficient knowledge about diabetes mellitus.

Factors that influence knowledge are age, gender, and education. It can be seen that most elderly people with diabetes mellitus are aged 45-59 years, with a total of 51 (60%) elderly people with diabetes mellitus. This means that age influences knowledge because most people with diabetes mellitus are middle-aged elderly people between the ages of 45-59 years. Most elderly people with diabetes mellitus are aged 45-59 years, with a total of 51 (60%) elderly people with diabetes mellitus. This means that age affects knowledge because most people with diabetes mellitus are middle-aged elderly people between the ages of 45-59 years. According to Zhang et al (2022), as a person ages, their mental development and ability to comprehend information also matures, but the ability to remember and accept new information may decline in old age¹².

Research by Ernawati et al (2021) shows that before being given education using interactive digital media, most respondents with chronic diseases such as diabetes mellitus had a low level of knowledge about managing their disease. This was because the conventional education provided previously was uninteresting and difficult for older adults to understand¹³.

Researchers assume that the low level of knowledge among older adults about diabetes mellitus prior to receiving health promotion is influenced by factors such as age, gender, and education, as well as the limitations of previous educational methods, which were uninteresting and difficult for older adults to understand. Researchers also believe that presenting information in a more structured and easily

understandable manner can help improve older adults' knowledge.

Level of knowledge about diabetes mellitus among the elderly after receiving health promotion through flipbooks

Level of knowledge about diabetes mellitus among the elderly after receiving health promotion through flipbooks Most elderly people with diabetes mellitus have good knowledge about diabetes mellitus, namely 51 (60%) elderly people with diabetes mellitus, while 37 (38.5%) elderly people with diabetes mellitus have adequate knowledge.

Knowledge can be increased through learning and experience, especially if the information is conveyed clearly, interestingly, and in accordance with the characteristics of the recipient of the information¹⁴. In addition, according to Rubi He (2022), interactive and visual-based educational media can facilitate the understanding of health information, thereby increasing a person's knowledge and awareness in applying healthy behaviors¹⁵.

The results of this study are in line with research conducted by Anggraeni (2024), which concluded that providing health education can increase knowledge after the education is given, with significant results¹⁶. This is reinforced by research conducted by Hidayatullah (2023), which shows that the frequency distribution of knowledge levels before and after education in the form of leaflet-based education¹⁷.

Researchers assume that knowledge is acquired through the five senses, such as sight, hearing, smell, taste, and touch. Good knowledge can improve the quality of life of people with diabetes mellitus. One of the efforts to control diabetes in the elderly is through health promotion, namely learning that improves the community's ability to take care of themselves and their environment, adapted to the local socio-culture and supported by health policies.

Analysis of the effect of health promotion using flipbooks on knowledge about diabetes mellitus among the elderly

The results showed that before receiving health promotion through flipbooks, most elderly people with diabetes mellitus had poor knowledge (50.6%), adequate knowledge (41.2%), and good knowledge (8.2%). After the health promotion (post-test), the majority had good knowledge (60%), adequate knowledge (34.1%), and poor knowledge (5.9%). Analysis using the Wilcoxon test showed a p-value of 0.000 (<0.05), indicating that health promotion using flipbooks had an effect on the knowledge of diabetes mellitus among elderly people in the Tuban Community Health Center working area.

According to Lawrence Green in Hamidi (2024), human behavior is influenced by predisposing factors (knowledge, attitudes, beliefs, values), enabling factors (support from friends, caregivers, guardians, health workers), and facilitating factors (health facilities, environmental sanitation). This theory is widely used in health promotion programs through the precede-proceed model, which analyzes behavioral factors and follows up on them to encourage positive change¹⁸.

The results of this study are in line with Saritessa's (2025) research, which found that health promotion through digital flipbook media effectively increases the knowledge of people with diabetes mellitus, as evidenced by higher post-test scores. This media is attractive to people with diabetes mellitus and is able to present information in an interactive, portable, and multimedia format, thereby encouraging participation in learning about diabetes mellitus prevention¹⁹.

According to Mishu (2021), 75–87% of knowledge is conveyed through sight. Digital flipbooks as a health promotion medium stimulate sight and hearing, improving information retention. This interactive media helps older adults understand diabetes

prevention, increases their knowledge, and encourages behavioral changes towards a healthier lifestyle²⁰. In line with the research by Ristanto et al. (2022), digital flipbooks can increase motivation, interest, understanding, and learning outcomes, including understanding of diabetes mellitus prevention materials. Increased knowledge plays a role in shaping attitudes and actions, as well as improving quality of life²¹.

Flipbooks are a practical, attractive, and portable promotional medium, effectively increasing older adults' knowledge about the definition, characteristics, effects, causes, prevention, treatment, and habits related to diabetes mellitus, and have been proven to significantly increase knowledge²².

Researchers assume that the increase in older adults' knowledge about diabetes mellitus is influenced by their enthusiasm in following the material, actively asking questions, and answering questions during health promotion. Education level also influences understanding, with older adults with higher education levels finding it easier to absorb information. Gender also plays a role, with older women tending to be more responsive and have better knowledge. This combination of behavioral, educational, and gender factors supports the effectiveness of flipbooks in increasing the elderly's understanding and awareness of diabetes mellitus prevention and management.

4. CONCLUSION

The use of flipbooks in health promotion has shown a significant increase in the knowledge of elderly people with diabetes mellitus. Before the intervention, most elderly people had insufficient knowledge, whereas after receiving health promotion, the majority demonstrated good knowledge. The effectiveness of flipbooks is supported by the enthusiasm and active participation of the elderly during the activities, and is influenced by

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demographic factors such as education level and gender, which play a role in understanding the material.

For future researchers, it is recommended to expand the research sample and optimize flipbooks as a means of health promotion.

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