

The Impact of Booklet-Based Nutrition Counseling on Knowledge and Nutritional Attitudes among Inpatients with Type 2 Diabetes Mellitus at a District Hospital in Southwest Aceh

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Submitted : 27/06/2025

Accepted: 24/12/2025

Published: 30/12/2025

Abstract

Diabetes mellitus is a chronic metabolic disorder characterized by insufficient insulin production or the body's inability to effectively utilize insulin. In Indonesia, the prevalence of diabetes mellitus in 2023 reached 1.7%, while in Aceh Province it was 1.6% of the total population. In Southwest Aceh District, there were 5,339 reported cases of diabetes mellitus. This study aimed to develop a booklet as a nutrition counseling medium and to evaluate its effect on nutritional knowledge and attitudes among hospitalized patients with type 2 diabetes mellitus at the Southwest Aceh District General Hospital. The study was conducted in two phases. The first phase involved booklet development using a Research and Development (R&D) approach. The second phase employed a quasi-experimental design with a one-group pre-test–post-test approach. A total of 22 respondents were selected using the Lemeshow formula. The study was conducted at Teungku Peukan District General Hospital, Southwest Aceh District, in December 2024. Data were analyzed using normality tests and dependent t-tests with a 95% confidence level ($p < 0.05$). The results showed that the mean knowledge score increased from 36.81 before nutrition counseling to 71.13 after counseling ($p = 0.000$). Similarly, the mean attitude score increased from 34.54 before the intervention to 48.09 after the intervention ($p = 0.000$). These findings indicate that booklet-based nutrition counseling significantly improves nutritional knowledge and attitudes among patients with type 2 diabetes mellitus.

Keywords: attitude, booklet, knowledge, type 2 diabetes patients

Introduction

Chronic metabolic disease known as diabetes mellitus (DM) is caused by the pancreas' inability to produce sufficient insulin, which impairs the body's ability to use it effectively. Not only that, blood sugar levels rise above the typical range of 70-140 mg/dl. In addition to elevated blood sugar levels above the typical range for diabetes mellitus, other symptoms of this disease are characterized by recurrent hunger, excessive thirst, and increased frequency of urination (Mauliza, 2023). Diabetes mellitus (DM) is a metabolic disease characterized by elevated blood glucose levels due to decreased insulin production by pancreatic beta cells and/or impaired response to insulin (insulin resistance) (Rusdi, 2020).

According to a report by the International Diabetes Federation (IDF), the number of people with diabetes mellitus (DM) worldwide in 2021 is estimated to reach 537 million (10.5%), and it

is estimated that the number of people with diabetes will reach 643 million (11.3% of the population) by 2030 if this is not controlled. The number is projected to continue rising to 783 million people (12.2%) by 2045 (IDF, 2021). The prevalence of diabetes is increasing in various countries, with the highest increase occurring in low- and middle-income countries in Southeast Asia and West Asia. According to the IDF, 16 out of every 100 people aged 20–70 in Indonesia have diabetes, primarily type 2 diabetes in adults, and this number is projected to increase by 31% over the next 15 years. This increase also contributes to the rising disease burden due to micro- and macrovascular complications caused by DM (Wibowo et al., 2021). The prevalence of diabetes mellitus in Indonesia, based on doctor diagnoses in 2023, is 1.7% across all age groups, with Aceh Province reaching 1.6%. Meanwhile, 50.9% of people in Aceh regularly check their blood sugar levels, 41.4% do not do so regularly, and 7.7% have never done so at all (SKI Compilation Team, 2023). The prevalence of statistical data from the E-Profilkes health service for diabetes mellitus patients in 2023 in Aceh Barat Daya Regency shows that there are 5, 339 cases, and the number of diabetes mellitus patients receiving healthcare services was 5,339 cases. Additionally, the proportion of diabetes mellitus types based on doctors' diagnoses across all age groups in Aceh Province was as follows: Type 1 (19.9%), Type 2 (54.8%), gestational diabetes mellitus (1.7%), and others (23.6%) (E-Profilkes, 2023).

Most individuals with type 2 diabetes tend to have irregular eating habits and lack physical activity. The lack of physical movement hinders the body's secretion system, leading to fat accumulation that, over time, can cause obesity and ultimately trigger diabetes. Lifestyle plays a significant role in the development of this disease (Cahyaningrum, 2023). Type 2 diabetes mellitus is a condition where the body's cells are unable to respond properly to insulin, known as insulin resistance, leading to elevated blood glucose levels (hyperglycemia). This type of diabetes is the most common, accounting for approximately 90% of all diabetes cases worldwide (Rosita et al., 2022). People with type 2 diabetes are at risk of developing a number of life-threatening conditions, including heart attacks, strokes, kidney failure, limb amputations, vision loss, and nerve damage. Therefore, it is crucial to receive appropriate treatment to prevent these conditions (Anggi & Rahayu, 2020). Risk factors for diabetes mellitus can be divided into two categories: the first being unmodifiable factors such as race, ethnicity, age, gender, family history, and birth weight above 4000 grams or below 2500 grams, while the second category includes modifiable factors that can be influenced through education, regular eating patterns, physical activity, and adherence to medication (Nurgaha, 2019). People with DM can prevent the disease by adopting healthy habits supported by a comprehensive understanding of the disease. Knowledge shapes attitudes and beliefs, which in turn influence behavior. In people with diabetes, low levels of knowledge have a negative impact on condition management, including inadequate education, improper diet, insufficient physical activity, and irregular medication intake, all of which can lead to elevated blood glucose levels (Nurgaha, 2019).

Efforts to prevent complications of DM involve lifestyle and dietary changes, as well as increasing knowledge and changing attitudes through nutritional counseling. Nutritionists use nutritional counseling with two-way communication techniques to help diabetes patients understand, feel better, behave better, address nutritional issues, and motivate changes in dietary patterns and lifestyle to improve blood glucose control in patients (Sitanggang, 2021). The use of booklets in nutrition counseling is chosen because booklets can effectively help counselors convey information comprehensively, concisely, and provide understanding about diabetes-

related dietary counseling to patients with type 2 diabetes. Booklets serve as educational materials designed in a structured, engaging manner, and are accompanied by images and illustrations to facilitate reader comprehension (Mauliza, 2023).

One effort to reduce the number of type 2 diabetes mellitus patients is through nutrition counseling using booklets, as Trisda and Bakri (2020) conducted a study on the effect of counseling using booklets on the knowledge and attitudes of diabetes mellitus patients and found that there was a significant effect of counseling using booklets in improving the knowledge ($p=0.00$) and attitudes ($p=0.001$) of diabetes mellitus patients at the TK II Iskandar Muda Hospital. Based on the above description, the researcher is interested in conducting research on “The Development of Booklets as a Medium for Nutritional Counseling on the Level of Knowledge and Attitudes of Type 2 Diabetes Patients in the Inpatient Ward of the West Aceh District Hospital.”

Methods

The method used in this study involved two stages. The first stage was the development of Research and Development (R&D) media. The development model used as a reference in developing this booklet was the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model. The second stage used a quasi-experimental design with a one-group pre-test-post-test design. The design involved a single group of subjects, but the variable measured was the effect of pre- post-nutritional counseling on knowledge and attitudes among type 2 diabetes patients in the inpatient ward of the Aceh Barat Daya District General Hospital.

This study was conducted at the Teungku Peukan District General Hospital in Susoh Subdistrict, Aceh Barat Daya District. The study was carried out in December 2024. The population of this study consisted of all 480 type 2 diabetes patients hospitalized at the hospital, comprising 154 men and 326 women, with an average of 40 patients treated per month in 2023 at Teungku Peukan District General Hospital, Aceh Barat Daya District. The study sample consisted of type 2 diabetes patients at Teungku Peukan District General Hospital in Aceh Barat Daya Regency. The sample size was 22.27, rounded to 22, determined using the Lamesshow formula for the minimum sample size. Data processing involves editing, coding, processing, and cleaning. Data analysis was conducted using univariate and bivariate methods. The statistical test for bivariate analysis was the dependent T-test at a 95% confidence level and a significance level of $p<0.005$. This research has been approved by the ethics commission of the Poltekkes Kemenkes Aceh with a number (DP.04.03/12.7/272/2024).

Result

Respondent Characteristics

Based on Table 1, it shows that out of 22 respondents, the majority of respondents were in the 40-59 age range (63.6%), with a more dominant proportion of women (54.5%). Most respondents were unemployed (54.5%) and the majority had a high school education (77.3%).

Table 1. Respondent Characteristics

Respondent Characteristics	Frequency (F)	Percentage (%)
Age		
20-39	4	18,2
40-59	14	63,6
60-79	4	18,2
Gender		
Male	10	45,5
Female	12	54,5
Employment		
Not working	12	54,5
Civil servant/military/police officer	2	9,1
Farmer	6	27,3
Private Employee	2	9,1
Latest Education		
Did not attend school/Completed elementary school	0	0,0
Completed elementary school	0	0,0
Completed junior high school	3	13,6
Completed senior high school	17	77,3
Higher education	2	9,1
Number	22	100,0

The Effect of Nutritional Counseling Using Booklets on the Knowledge and Attitudes of Type 2 Diabetes Patients

Table 2. The Effect of Nutritional Counseling Using Booklets on the Knowledge and Attitudes of Type 2 Diabetes Patients

Variable	Mean	SD	Δ Mean Difference \pm SD	CI 95%	p-Value
Nutrition Knowledge of Type 2 Diabetes Patients					
Before nutrition counseling using booklets	36,81	12,203	34,318 \pm 12,751	-39,318 – -28,664	0,000
After nutritional counseling using booklets	71,13	10,903			
Attitude of Type 2 Diabetes Patients					
Before nutrition counseling using booklets	34,54	4,687	13,545 \pm 5,965	-16,190 – -10,900	0,000
After nutritional counseling using booklets	48,09	3,279			

Based on Table 2, it shows that the average nutritional knowledge before receiving nutritional counseling using a booklet was 36.81, increasing to 71.13 after receiving nutritional counseling using a booklet, with a p-value of 0.000 ($p < 0.05$). not only that, the average attitude before receiving nutrition counseling using a booklet as a medium was 34.54, increasing to 48.09

after receiving nutrition counseling using a booklet as a medium, with a p-value of 0.000 ($p < 0.05$).

Discussion

The findings of this study indicate that the majority of respondents were aged 40–59 years, female, unemployed, and had a senior high school education. Age is an important factor in the development of type 2 diabetes mellitus, as pancreatic function and insulin sensitivity tend to decline with increasing age. Oktavia et al. (2022) reported that the incidence of diabetes mellitus increases significantly after the age of 40 years due to decreased insulin secretion and increased insulin resistance.

In this study, female respondents slightly outnumbered males. This finding is consistent with previous studies reporting a higher prevalence of type 2 diabetes mellitus among women. Ferlitasari et al. (2022) explained that women tend to have a higher body mass index and fat accumulation, particularly after menopause, which increases the risk of insulin resistance and diabetes. Educational level also plays a role in health-related knowledge and behavior. Arania et al. (2021) found that individuals with lower educational attainment tend to have poorer understanding of disease management, increasing their risk of developing diabetes and related complications.

The results of this study demonstrate a significant improvement in nutritional knowledge after the provision of booklet-based nutrition counseling. The mean knowledge score nearly doubled following the intervention, indicating that booklets are an effective educational medium for conveying nutrition-related information to patients with type 2 diabetes mellitus. These findings are consistent with previous research by Trisda and Bakri (2020), who reported significant improvements in knowledge among diabetes patients following booklet-based counseling. Similar results were reported by Srikartika et al. (2019), who found that the use of booklets significantly improved patients' understanding of dietary management in diabetes mellitus.

Booklets are effective because they present information in a structured, concise, and visually appealing format, allowing patients to read and review the material repeatedly at their own pace. Wahyuni et al. (2022) also found significant improvements in knowledge, behavioral changes, and fasting blood glucose levels among type 2 diabetes outpatients after receiving education using booklets. Furthermore, Kune et al. (2023) reported that booklet-based health education significantly improved dietary knowledge among patients with type 2 diabetes mellitus in a primary healthcare setting.

In addition to knowledge, this study also found a significant improvement in patients' attitudes toward nutrition management after receiving booklet-based counseling. Attitude change is a critical component of behavior modification, as positive attitudes can motivate individuals to adopt healthier dietary practices and lifestyle changes. The increase in attitude scores observed in this study is consistent with findings by Trisda and Bakri (2020) and Srikartika et al. (2019), who reported significant improvements in attitudes among diabetes patients following nutrition education using booklets. Nurhidayanti et al. (2023) also demonstrated that educational interventions using e-booklets were effective in improving attitudes toward diabetes prevention. Overall, the findings suggest that booklet-based nutrition counseling is an effective educational strategy for improving both knowledge and attitudes among hospitalized patients with type 2

diabetes mellitus. Improved knowledge and attitudes are expected to support better dietary practices and glycemic control, although further studies are needed to assess long-term behavioral and clinical outcomes.

Conclusion

This study concludes that booklet-based nutrition counseling has a significant effect on improving nutritional knowledge and attitudes among patients with type 2 diabetes mellitus in the inpatient ward of the Southwest Aceh District General Hospital ($p < 0.05$). The use of booklets as an educational medium can support patients in understanding diabetes management and adopting healthier attitudes toward nutrition. It is recommended that patients with type 2 diabetes mellitus continue to seek information about diabetes management through various educational media in addition to booklets, and that healthcare providers integrate booklet-based counseling into routine diabetes care.

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