

SOCIALIZATION OF HIGH-FIBER AND HIGH-PROTEIN MENUS FOR INDIVIDUALS WITH TYPE 2 DIABETES MELLITUS

Raihanah Suzan¹, Rita Halim², Fenny Amalia³, Esa Indah Ayudia⁴, Anggelia Puspasari⁵, Patrick William Gading⁶

^{1,2} Department of Clinical Nutrition, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, Indonesia

³ Department of Clinical Nutrition, Raden Mattaher Hospital Jambi, Jambi, Indonesia

⁴ Department of Physiology, Faculty of Medicine and Health Sciences, Universitas Jambi

⁵ Department of Biochemistry, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi

⁶ Department of Medical Rehabilitation, Faculty of Medicine and Health Sciences, Universitas Jambi

Corresponding author email: raihanah_suzan@unja.ac.id

ABSTRACT

Type 2 Diabetes Mellitus (T2DM) is a chronic disease prevalent worldwide and is one of the biggest public health challenges of the 21st century. Lifestyle changes and proper dietary patterns have proven effective for the prevention and management of diabetes mellitus. Emerging evidence shows that a high-protein and high-fiber diet is particularly beneficial. This Community Service Activity was conducted at the Puskesmas Koni in Jambi City. Participants attended a session on high-fiber and high-protein menu guidelines for individuals with T2DM presentation. The activity was attended by 30 participants, comprising 19 volunteers and 11 individuals with T2DM. Most participants, 21 people (70%) were aged 19 to 59 years, and 18 participants (60%) were female. The average pre-test score was 49.7, and the post-test score was 75. There was an increase in participants' knowledge after the socialization of the high-fiber and high-protein menu guidelines for individuals with T2DM.

Keywords: High-Protein Diet; High-Fiber Diet; Menu Guidelines; T2DM; Blood Sugar Management

ABSTRAK

Diabetes mellitus tipe 2 (DMT2) adalah penyakit kronis yang tersebar di seluruh dunia dan merupakan salah satu masalah kesehatan masyarakat terbesar abad ke-21. Perubahan gaya hidup dan pola makan yang tepat telah terbukti efektif untuk pencegahan dan pengelolaan diabetes mellitus. Bukti yang berkembang saat ini menunjukkan bahwa diet tinggi protein dan serat sangat bermanfaat. Kegiatan Pengabdian Pada Masyarakat (PPM) dilaksanakan di Puskesmas Koni kota Jambi. Peserta mengikuti sosialisasi terkait panduan menu tinggi serat dan protein untuk penyandang DMT2. Kegiatan diikuti oleh 30 orang peserta, yang terdiri dari 19 orang kader puskesmas dan 11 orang penyandang DMT2. Sebagian besar peserta yaitu 21 orang peserta (70%) berusia 19 hingga 59 tahun, 18 orang peserta (60%) berjenis kelamin perempuan. Dengan rerata nilai pre tes 49,7 dan nilai post tes 75. Terjadi peningkatan pengetahuan peserta pengabdian setelah dilakukan sosialisasi panduan menu tinggi serat dan protein untuk penyandang DMT2.

Kata kunci: Diet Tinggi Protein; Diet Tinggi Serat; Panduan menu; DMT2; Manajemen gula darah

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is a chronic disease that is widespread globally and represents one of the largest public health issues of the 21st century. In 2017, approximately 425 million people worldwide were living with T2DM, a number projected to reach 693 million by 2045. The high incidence and prevalence are attributed to an increasing elderly population and a lifestyle characterized by physical inactivity and dietary habits that encourage obesity and metabolic syndrome. According to the literature, obesity can predispose individuals to chronic non-communicable diseases such as T2DM, hypertension, and cardiovascular disease. For patients with T2DM and those who are overweight, progressive weight loss is recommended to improve quality of life and treatment outcomes. This recommendation is based on studies showing several weight loss benefits, including improved glycemic control, cardiometabolic markers, and quality of life.^{1,2}

Lifestyle changes and proper dietary adjustments have been proven effective for the prevention and management of diabetes mellitus. Medical nutrition therapy (MNT) is an essential component of diabetes management, including counseling and dietary recommendations aimed at optimizing metabolic control and maximizing treatment outcomes. This involves dietary planning tailored to the patient's needs and regular monitoring. Clinical evidence indicates that diabetic patients who receive MNT experience a reduction in HbA1c by 1-2% and a decrease in healthcare costs, leading to overall health improvements and quality of life.²

Many studies indicate that the nutritional composition of dietary strategies is crucial and can affect glucose and lipid profiles in diabetic patients. Although the optimal diet for diabetic patients is still undetermined, emerging evidence suggests that a high-protein and high-fiber diet is highly beneficial. Research on animal and human models has shown increased insulin production and decreased postprandial glucose levels after



protein intake. High protein intake has also been shown to benefit T2DM patients even without calorie restriction or weight loss. On the other hand, dietary fiber intake is known to delay gastric emptying and promote satiety, while reducing cholesterol absorption, resulting in lower LDL-C concentrations. Dietary fiber also enhances bile acid excretion through feces and reduces its absorption in the small intestine. Additionally, the viscosity of dietary fiber delays intestinal glucose absorption, leading to decreased insulin secretion. Lower insulin levels result in reduced HMG-CoA reductase activity, contributing to lower LDL-C levels.³⁻⁶

Indonesian diets are predominantly cereal-based but low in protein. On the other hand, Medical intervention, dietary modification (high protein, fiber, monounsaturated and polyunsaturated fatty acids), and physical activity can help manage lifestyle-related diseases, particularly T2DM. Based on the above discussion and the limited publication on high-fiber and high-protein menu guidelines for T2DM patients in Indonesia, the creation of a dietary guide for T2DM patients is essential. Furthermore, it is necessary to socialize these dietary guidelines with T2DM patients to facilitate their daily application, enabling better blood sugar control.

METHODS

The Community Service (CS) Team created a high-fiber and high-protein menu guide for T2DM patients. This menu guide was then presented to the community. At the beginning of the socialization activity, participants were asked to complete a pre-test prepared by the CS team to assess their knowledge of nutrition for T2DM patients. The speaker then presented the high-fiber and high-protein menu guide for T2DM patients using a PowerPoint presentation. This was followed by an interactive dialogue to enhance participant understanding of the material provided. At the end of the activity, the CS team administered a short post-test to assess participants' understanding of the material.

RESULTS AND DISCUSSION

The CS activity "Socialization of High-Fiber and High-Protein Menu Guidelines for T2DM Patients" was held on November 2, 2024, at Puskesmas Koni in Jambi City. The activity was attended by 30 participants, including 19 volunteers and 11 T2DM patients. The characteristics of the participants in the PPM activity included:

a. Age and Gender

Based on **Figure 1**, this activity was mostly attended by adult participants aged 19 to 59 years, totaling 21 people (70%). The majority of participants were female, with 18 people (60%).

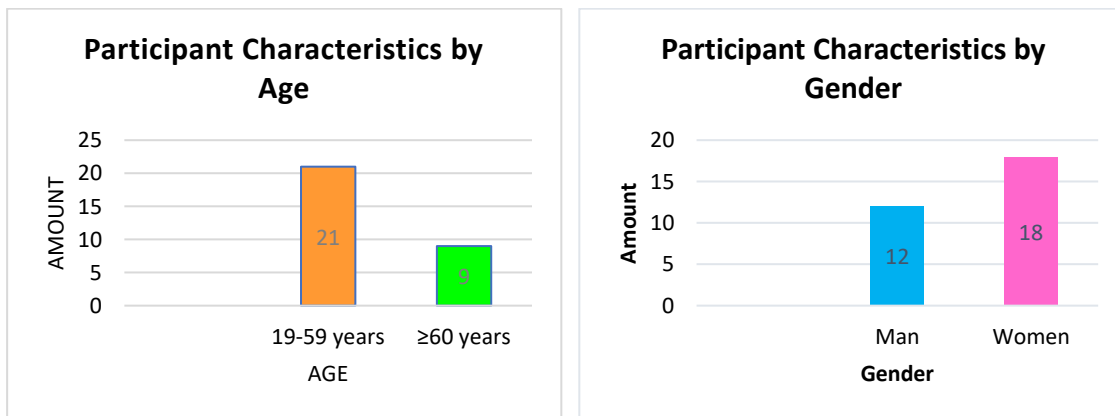


Figure 1. Participant Characteristics by Age and Gender

b. Increase in Knowledge

Based on Figure 2, there was an increase in the participants' pre-test scores in the CS activity, with an average score rising from 49.7 to 75 on the post-test. Out of 24 participants who scored below 70 on the pre-test, only 7 scored below 70 on the post-test. This indicates that the CS activity successfully achieved its goal, which was to improve the understanding and awareness of volunteers and T2DM patients, enabling them to apply appropriate nutritional intake for T2DM patients and effectively control blood sugar levels.

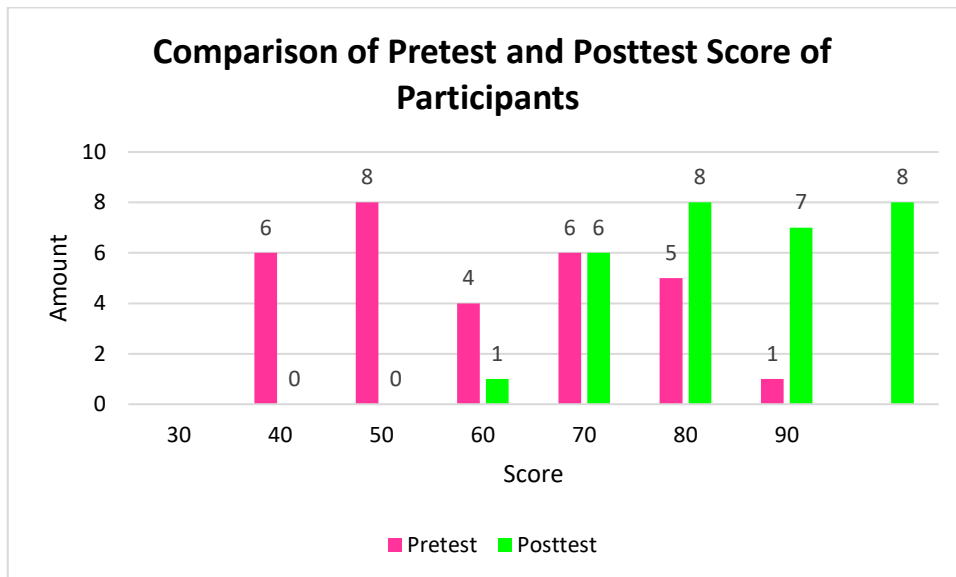


Figure 2. Comparison of Pretest and Posttest Score of Participants

A broader socialization effort is needed for this activity. A comprehensive evaluation should also be conducted after volunteers and T2DM patients have implemented high-fiber and high-protein dietary guidelines in nutritional management for T2DM patients.



Figure 3. Participant registration process



Figure 4. Head of Puskesmas Koni giving an opening speech



Figure 5. The speaker presented a guide on high-fiber and high-protein menus for people with Type 2 Diabetes Mellitus



Figure 6. Community Service Team with Participants



Figure 7. Community Service Team with the Head of Puskesmas Koni

CONCLUSIONS

The Community Service Activity (PPM) titled “Socialization of High-Fiber and High-Protein Menu Guidelines for T2DM Patients” has been completed. There was an increase in understanding and awareness among CS participants, which is expected to enable them to apply appropriate nutritional intake for T2DM patients in their daily lives and better control blood sugar levels.

ACKNOWLEDGMENT

This activity ran smoothly thanks to the support from various parties, namely:

1. The Head of Puskesmas KONI, along with health center volunteers and residents of Pasar District, Jambi City.
2. The Institute for Research and Community Service of Universitas Jambi its contributions and financial support.

REFERENCES

1. Minari TP, Tácito LHB, Yugar LBT, et al. Nutritional Strategies for the Management of Type 2 Diabetes Mellitus: A Narrative Review. *Nutrients* 2023;15(24); doi: 10.3390/nu15245096.
2. Viswanathan Dharini Krishnan Sanjay Kalra Rajeev Chawla Mangesh Tiwaskar Banshi Saboo Manash Baruah Subhankar Chowdhury M Makkar Shalini Jaggi VB, Krishnan D, Kalra S, et al. Insights on Medical Nutrition Therapy for Type 2 Diabetes Mellitus: An Indian Perspective. n.d.; doi: 10.6084/m9.figshare.7558802.
3. Bhoite R, Chandrasekaran A, Pratti VL, et al. Effect of a High-Protein High-Fibre Nutritional Supplement on Lipid Profile in Overweight/Obese Adults with Type 2 Diabetes Mellitus: A 24-Week Randomized Controlled Trial. *J Nutr Metab* 2021;2021; doi: 10.1155/2021/6634225.
4. Malaeb S, Bakker C, Chow LS, et al. High-Protein Diets for Treatment of Type 2 Diabetes Mellitus: A Systematic Review. *Advances in Nutrition* 2019;10(4):621–633; doi: 10.1093/advances/nmz002.
5. Ni Y, Zheng A, Hu Y, et al. Compound dietary fiber and high-grade protein diet improves glycemic control and ameliorates diabetes and its comorbidities through remodeling the gut microbiota in mice. *Front Nutr* 2022;9; doi: 10.3389/fnut.2022.959703.
6. Dharmatti G, Singh N, Ghag A. Dietary fiber in the management of type 2 diabetes mellitus: A narrative review. *Chronicle of Diabetes Research and Practice* 2023;2(2):84; doi: 10.4103/cdrp.cdrp_21_22.