

The Relationship between Macronutrient and Fiber Intake and Fasting Blood Sugar Levels in Type 2 Diabetes Mellitus Patients at the Tapen Community Health Center in Bondowoso Regency

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ABSTRACT

Type 2 diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia resulting from insulin resistance and impaired insulin secretion. The control of fasting blood glucose levels is influenced by macronutrient and fiber intake, which play important roles in regulating glucose metabolism. This study aimed to analyze the relationship between energy, protein, fat, carbohydrate, and fiber intake and fasting blood glucose levels among patients with type 2 diabetes mellitus at Tapen Primary Health Center, Bondowoso Regency. This study employed an analytical observational design with a cross-sectional approach. A total of 79 respondents were selected using proportional random sampling. Dietary intake data were collected using three 24-hour food recalls (two weekdays and one weekend day), while fasting blood glucose levels were measured after a minimum fasting period of 8 hours. Data were analyzed using Spearman's rank correlation test. The results showed that the majority of respondents had excessive energy intake (56.9%), inadequate protein intake (50.6%), excessive fat intake (56.9%), excessive carbohydrate intake (60.7%), and inadequate fiber intake (41.7%). The median fasting blood glucose level was 133 mg/dL. Significant correlations were found between energy intake ($r = 0.428$; $p < 0.001$), protein intake ($r = -0.244$; $p = 0.031$), fat intake ($r = 0.354$; $p < 0.001$), carbohydrate intake ($r = 0.280$; $p = 0.012$), and fiber intake ($r = -0.413$; $p < 0.001$) and fasting blood glucose levels. Higher energy, fat, and carbohydrate intakes were associated with higher fasting blood glucose levels, whereas higher protein and fiber intakes were associated with lower fasting blood glucose levels.

Keywords: *Macronutrient intake, Type 2 diabetes mellitus, Fasting blood glucose, Dietary fiber, Glycemic control.*