

LETTER TO EDITOR

Four Pillars and Blood Glucose Levels in Type 2 Diabetes Mellitus Patients before and after Nutritional Support in Indonesia

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Dear Editor

Meal planning (nutritional therapy) is a major component of the successful management of diabetes mellitus (DM). Nutrition management aims to help people with DM improve eating habits, so they can control glucose, fat and blood pressure levels and can reduce the risk of complications (1). The key to the success of medical nutritional therapy is the involvement of a team consisted of doctors, dietitians, nurses and other health workers, as well as the patient himself to improve his ability to achieve good metabolic control. In addition, the team's involvement in 4 sections, namely assessment of individual metabolic parameters and lifestyle, encouraging patients to participate in setting goals to be achieved, choosing adequate nutritional interventions and evaluating the effectiveness of planning nutritional services (2).

Nutritional education is an integral part that cannot be separated in the nutritional management of patients with DM. Nutrition education about food and drink knowledge, sensitivity and recognition of

several things that have the potential to encourage malnutrition. In a Quasi-experimental research with pre-test-post-test control group design, the characteristics of the subjects including gender, age, employment status, education, duration of DM were investigated. As Table 1 shows, there was an increase in knowledge after nutritional assistance and the average diet compliance score demonstrated an increase in both treatment and control groups. In line with this research, nutritional assistance was shown to increase the knowledge in management of DM that was evidenced by an increase in respondents' knowledge (86.7%) (3).

Nutritional education could increase the knowledge score in patients with DM after giving the needed educational plan for more than once. There was no difference in adherence score before and after the interventions in both groups, but the findings revealed an increase for the compliance score. After nutritional assistance in the treatment group, dietary adherence to energy intake increased by 23.5% that contributed to control the blood glucose level by 54.9%.

Table 1: Differences in knowledge, diet compliance, physical activity, medication compliance, and blood glucose in the two groups.

Variable	Treatment group n=30		Control group n=30	
	Mean±SD	P value	Mean±SD	P value
Knowledge before treatment	53.89±10.96	0.004	49.06±10.28	0.040
Knowledge after treatment	69.41±11.62		56.2±11.32	0.0001
Δ Knowledge	15.52±0.66		7.14±0.83	
Dietary compliance before treatment	36.06±6.60	0.210	36.46±6.08	0.300
Dietary compliance after treatment	56.24±7.35		45.12±6.17	0.247
Δ Dietary compliance	20.18±0.75		8.66±0.09	
Physical activity before treatment	50.87±10.96	0.005	49.06±10.22	0.024
Physical activity after treatment	69.71±11.62		56.2±11.34	0.0001
Δ Physical activity	18.84±0.69		7.14±1.12	
Medication adherence before treatment	53.73±10.76	0.003	58.26±10.28	0.038
Medication adherence after treatment	69.32±11.92		66.24±11.32	0.0001
Δ Medication adherence	15.59±1.16		7.98±1.04	
Blood glucose levels before treatment	52.82±10.96	0.004	50.06±10.25	0.025
Blood glucose levels after treatment	69.41±11.63		56.2±11.30	0.0001
Δ Blood glucose levels	16.59±0.67		6.14±1.05	

Δ: Delta, SD: Standard deviation.

It could increase the protein intake by 22.6% and control the blood glucose level by 40.1%. Also, it led to an increased fat intake by 36.7% that resulted in the control of blood glucose level by 2.5% and finally it could increase carbohydrate intake by 3.9% that contributed to control the blood glucose level by 58.9%.

There was a difference among both groups before and after nutritional support for physical activity and medication adherence scores, and in blood glucose level. Nutritional education could increase patients' knowledge and reduce patients' fasting blood glucose. These findings are identical to results described previously demonstrating an increase in patients' knowledge after being given the educational assistance at a good level of knowledge from 14% to 22%, quite good level of knowledge from 50% to 68% and less good level of knowledge from 36% to 10%; meanwhile, the average value of fasting blood sugar decreased by 23 mg/dL. The four pillar and blood glucose levels of type 2 DM patients before and after nutritional assistance at the Tlogosari Wetan Health Center showed an increased respondents' knowledge and adherence to diet, physical activity and taking medication as well as controlling blood glucose levels.

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research to completion.

Authors' Contribution

Study concept and design: Y.Y. and Z.I.; acquisition of data: S.P., S.W.K ; analysis and interpretation of data: Y.Y. and Z.I; drafting of the manuscript: Z.I. and W.W.; critical revision of the manuscript: Y.Y, Z.I., ; statistical analysis: S.P and S.W.K.; obtained funding: Y.Y.; administrative, technical, or material support: Y.Y and W.W.; and study supervision: Y.Y.

Conflict of Interest

None declared.

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