

CASE REPORT

Case Report: Nursing Intervention for Improving Nutritional Status in Patient With Type 2 Diabetes Mellitus

Meriska Winanda Tenri¹, Sofhya Silalahi¹, Dessi Kusmawati¹, Ria Sitorus², Bambang Nugraha³, Nursiswati Nursiswati³

¹ Faculty of Nursing, Universitas Padjadjaran, Bandung 45363, Indonesia

² Department of Nursing, Dr. Hasan Sadikin General Hospital, Bandung 45363, Indonesia

³ Department of Medical and Surgical Nursing, Faculty of Nursing, Universitas Padjadjaran, Bandung 45363, Indonesia

ABSTRACT

The decline in nutritional status has resulted in worsening of clinical conditions for patients with type 2 diabetes mellitus. This case report contains a unique case presentation: a patient with T2DM who is malnourished compared to a normal T2DM patient who is overweight. A 61-year-old female patient who experienced changes in nutritional status was involved. The changes in the patient's nutritional status were characterised by decrease in appetite as well as BMI to 18.2 kg/m², nausea, vomiting and weakness. The Random Blood Sugar test resulted as 683 mg/dL and HbA1c level > 15%. Having received the nursing interventions for three days, the patient began to consume the whole portion of the meal provided, with less nausea and vomiting, and decrease in blood sugar level to 274 mg/dL. Careful assessment and regular monitoring are needed to determine what nursing interventions are to be given in order to improve nutritional status of T2DM patients.

Keywords: Indonesian, Nursing Intervention, Nutrition Status, Type 2 Diabetes Mellitus

Corresponding Author:

Meriska Winanda Tenri, Ners

Email: meriska19001@mail.unpad.ac.id

Tel: +6285240555008

INTRODUCTION

Weight loss is one of the symptoms in people with type 2 diabetes mellitus (T2DM). It is caused by defects in insulin secretion and insulin resistance prevents blood glucose from entering muscle cells and fat tissue. This causes muscles and fat tissues to break down energy reserves through the process of glycogenolysis and lipolysis to obtain energy sources; if it continues, the mass of muscles and fat tissues will decrease, resulting in weight loss and putting patients at risk of malnutrition (1).

Malnutrition is a crucial predictor of lengthening patient days and worsening patient clinical condition. As the impact in the form of a decrease in nutritional status of T2DM patients is extensive, it is important that nurses identify a patient who is at risk of malnutrition from the start. It is recommended that a patient's nutritional status be identified using valid and reliable instruments. However, screening tools are not frequently used in daily clinical practice so that patients who are malnourished cannot be identified early on.

Nutrition plays a great role in T2DM patients to overcome the symptoms and to support their health management. Good nutritional status in T2DM patients also affects their HbA1c levels and insulin sensitivity. Based on the standards established by Nursing Intervention Classification (NIC), nursing interventions that can be carried out by nurses in improving the nutritional status of T2DM patients cover nutritional status monitoring, nutritional management, nutrition therapy, and nutrition counselling.

Attention to nutritional care in clinical settings is still lacking; thus, case reports on nutritional care are expected to increase the awareness of the health team to improve the quality of nutritional care, reduce the lack of individualised nutritional care and interdisciplinary approaches in managing patient nutrition problems (2). The purpose of the present case study is to describe the interventions conducted by the nurses in improving nutritional status of the T2DM patient

CASE REPORT

The case report began with the initial stage, which is requesting the research permission. The patient was given an explanation about the purpose of the observation and action planned on her as well as was asked for her agreement by filling out an informed consent. The

anthropometric and Malnutrition Screening Tools (MST) analyses were undertaken to determine her current nutritional status.

Mrs. M, a 61-year-old woman working as a farmer, was treated with a diagnosis of type 2 diabetes mellitus. The patient was admitted with complaints and her family stated that she seemed to have loss of orientation and decreased consciousness, nausea and vomiting, weakness, fever and decreased appetite. The patient was diagnosed with T2DM since ± 10 years ago. About six months before being hospitalised, she rarely did blood glucose control, only took medicine when experiencing weakness, and did not undertake diabetes-diet-based food control. The patient’s family expressed difficulty in regulating the patient’s diet due to their lack of information and knowledge regarding the dietary requirements of patients with T2DM.

The assessment of the patient’s nutritional status using the MST resulted in a score of 3, indicating the need for further nutritional assessment. Additionally, the anthropometric analysis showed that the patient had a body weight of 45 kg and a height of 157 cm, resulting in a BMI calculation of 18.2 kg/m². This is included in the category of underweight. During the observation, the patient had experienced Hyperglycaemic Hyperosmolar Nonketotic Syndrome (HHNK), the clinical manifestations of which included decreased consciousness (somnia) on her first day of hospital admission, polyuria, and the random blood glucose test resulted in 683 mg/dL and HbA1c > 15%, with an Hb of 12.2 g/dL.

Based on the analysis, the nursing diagnosis was obtained, which is a nutritional imbalance (less than body requirements) related to biological factors. The diabetic diet was given according to the 3J rules, i.e., *Jumlah* (Amount), *Jenis* (Type), and *Jadwal* (Schedule) of meals. Main meals to be consumed are adjusted to the recommended standard, which are food with a balanced composition in terms of carbohydrates, protein, and fat

in order to achieve good nutritional adequacy. The meal schedule consists of three main meals and 2–3 small snacks (Table I).

In addition to educating the diabetes mellitus patient about proper nutrition, nutrition therapy was given as another nursing intervention, which included providing selected foods based on the consultation with nutritionists during the patient’s hospitalisation. Also, pharmacological therapy was given in collaboration between doctors and pharmacists including administration of insulin novorapid 14 u/8 hours and Levemir 12 u/24 hours to treat hyperglycaemia.

The evaluation indicated that the nursing problems can be overcome, in part due to the positive responses from the patient and her family to the interventions provided. This is supported by the family stating that the patient began to consume full portions of food daily during the hospitalisation, and also experienced a decrease in blood sugar level to 274 mg/dL.

DISCUSSION

The monitoring of nutritional status began with assessing the patient’s current nutrition. It was found that she had complaints of nausea, vomiting, decreased appetite, weight loss in the underweight category as well as MST in a score of 3, indicating the need for further nutritional assessment. This was suspected as a clinical manifestation of complications of diabetic gastroparesis (3). Diabetic gastroparesis is associated with poor glycaemic control. It had not been conducted on the patient, however, due to limited facilities and health insurance coverage. Nevertheless, at least an examination of nutritional status using the MST and anthropometric examination have been executed. Malnutrition Screening Tools (MST) identify changes in body weight, food intake and statements of patients with specific diagnoses.

The anthropometric examination resulted in the patient being classified as underweight according to WHO.

Table I: Monitoring of Nutrition Intake in the Hospitalized Patient

Day-	Time	Meal	Description
1	Breakfast	porridge, boiled egg, sweet and sour vegetable soup, banana	Unfinished
	Lunch	porridge, fish, vegetable soup, papaya	Unfinished
	Dinner	porridge, egg, mashed potato fritters	Unfinished
2	Breakfast	porridge, boiled egg, fried tempeh, watermelon	Finished
	Lunch	porridge, chicken, sweet and sour vegetable soup, banana	Unfinished
	Dinner	porridge, fish, vegetable soup in chicken/beef broth	Unfinished
3	Breakfast	rice, egg, vegetable soup in chicken/beef broth, banana	Finished
	Lunch	rice, fish, sweet and sour vegetable soup, watermelon	Unfinished
	Dinner	rice, fish, sweet and sour vegetable soup	Finished
4	Breakfast	rice, egg, fried tempeh, papaya	Finished
	Lunch	rice, chicken, tofu soup, banana	Finished
	Dinner	rice, fried fish, tempeh, watermelon	Finished

*This table shows the monitoring of the patient’s nutritional intake while in the hospital

This weight loss can also be caused by poor glycaemic control (4). Further, the monitoring of nutritional status was carried out using a valid instrument. It was found that the MST score is 3, indicating that the patient is at risk of malnutrition. The National Institute for Health and Care Excellence (NICE 2017) recommends that nutritional status assessments be undertaken when the patient enters the room and be repeated every week afterward. This programme has not been carried out on patient because the patient has not been hospitalised for one week.

The results exhibited that the patient and her family were less educated about nutrition or dietary requirements for patients with diabetes mellitus. Therefore, the nurses provided the related information via leaflets as part of the nutrition counselling intervention. Fibre is related to increased function of good bacteria and short chain fatty acids, which is proven to directly play a positive role in energy metabolism. Furthermore, T2DM patients are advised to choose vegetable or animal protein. They are recommended to reduce high-fat products and it is best for T2DM patients to take fruit, low-fat yogurt, boiled nuts, or unsalted nuts as snacks.

In the case of the elderly, their particular condition affects the selection and preparation of food. For this reason, family involvement is highly needed in helping patients regulate their nutritional intake. The observational study conducted by Pesantes et al. (2018) in Peru reveals that family plays a role in helping healthy meal preparation for patients; reminding patients to maintain their diet, take medication, and control blood glucose (5).

The patient's lack of proper diet maintenance while still at home caused a drastic increase in glucose level, i.e., up to 683 mg/dL. The examination of HbA1c showed that the level > 15%. An increase in serum HbA1c (> 6.5%) indicated an irregular glycaemic condition for three consecutive months. Upon further observation, the patient had experienced HHKN syndrome, an acute and dangerous complication in T2DM patients. In addition to the decreased nutritional status, the patient also had a poor level of glycaemic control.

The present case report discusses a case and nursing interventions given to a T2DM patient with a unique condition, i.e., decreased nutritional status, severe hyperglycaemia 683 mg/dL with HbA1c level > 15%.

CONCLUSION

The decreased nutritional status and dietary control have been responsible for the decreased glycaemic control, which eventually led to the decrease in health status of the T2DM patient. Therefore, careful assessment and regular monitoring were required to determine what types of nursing interventions can be provided in order to improve the patient's nutritional status. Moreover, the multidisciplinary collaboration and family involvement were vital to improve the nutritional status of the T2DM patient. We recommend improving the nutritional status of healthcare services in T2DM patients because nutritional management is still an important challenge in managing T2DM.

ACKNOWLEDGEMENTS

Our appreciation goes to the Regional Public Hospital (RSUD) of Luwuk City, Central Sulawesi Province and the Medical Surgical Nursing team of the Nursing Faculty of UNPAD.

REFERENCES

1. Kusnanto K, AriPn H, Widyawati IV. A qualitative study exploring diabetes resilience among adults with regulated type 2 diabetes mellitus. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2020;14(6):1681-7.
2. Kusnanto K, Kurniawati N, Bakar A, Wahyuni Ed, AriPn H, Pradipta R. Spiritual-Based Motivational Self-Diabetic Management on the Self-Efficacy, Self-Care, and HbA1c of Type 2 Diabetes Mellitus. *Sys Rev Pharm*. 2020;11(7):304-8.
3. Ramos FD, Fontanilla JA, Lat RE. Association between Degrees of Malnutrition and Clinical Outcomes among Non-critically Ill Hospitalized Adult Patients with Type 2 Diabetes Mellitus. *J ASEAN Fed Endocr Soc*. 2021;36(2):172-9.
4. Ojo O, Weldon SM, Thompson T, Crockett R, Wang XH. The Effect of Diabetes-Specific Enteral Nutrition Formula on Cardiometabolic Parameters in Patients with Type 2 Diabetes: A Systematic Review and Meta-Analysis of Randomised Controlled Trials. *Nutrients*. 2019;11(8).
5. Pesantes MA, Del Valle A, Diez-Canseco F, Bernabé-Ortiz A, Portocarrero J, Trujillo A, et al. Family Support and Diabetes: Patient's Experiences From a Public Hospital in Peru. *Qualitative health research*. 2018;28(12):1871-82.