Application of Nurse-Led Evidence-Based Nursing in Newly Diagnosed Type 2 Diabetes Patients

Lina Jiang[1] & Fenghua Tian[2]

[1] Inner Mongolia Medical University, Huhhot, China

[2] Chifeng Clinical Medical College, Inner Mongolia Medical University, Chifeng, China

Correspondence: Fenghua Tian, Chifeng Clinical Medical College, Inner Mongolia Medical University, Chifeng, Inner Mongolia, China.

Abstract

Objective: To apply nurse-led evidence-based nursing to newly diagnosed patients with type 2 diabetes, and to analyze its effect.

Methods: Convenience sampling method was adopted, and 42 patients with initial diagnosis of T2DM who were admitted to the endocrinology department of a tertiary hospital in Chifeng City from September 2021 to February 2022 were included in the study. Grouping was done by random number table method, and finally 21 cases were included in each of the experimental group and the control group. The patients in the control group received routine nursing in the endocrinology department, and the patients in the experimental group received evidence-based nursing led by nurses on this basis. The glucose metabolism indexes and self-management behaviors of the two groups of patients were analyzed.

Results: After routine nursing and nurse-led evidence-based nursing for newly diagnosed patients with type 2 diabetes, the blood sugar control of the experimental group was significantly better than that of the control group, and the difference was statistically significant (P<0.05). The behavior was better than that of the control group, and the difference was statistically significant (P<0.05). The nursing satisfaction of the patients in the experimental group was higher than that of the control group, and the difference was statistically significant (P<0.05).

Conclusion: In view of the particularity of the newly diagnosed type 2 diabetes patients, in the process of nursing them, the nurse-led evidence-based nursing can effectively control the blood sugar level and improve the patients' self-esteem based on summarizing the best evidence. Management ability and nursing satisfaction are worthy of promotion and application in clinical practice.

Keywords: newly diagnosed type 2 diabetes, evidence-based nursing, nurse-led, blood sugar

1. Introduction

Diabetes Mellitus (DM) is a metabolic disorder of protein, fat, and sugar caused by the relative or absolute lack of insulin secretion, as well as the secondary disorder of water and electrolyte metabolism, with elevated blood sugar as the main clinical feature group of metabolic diseases (Ye, R.-G., & Lu, Z.-Y., 2006) Diabetes is a life-long disease, and lifestyle, diet control, and exercise are the main treatments. Newly diagnosed T2DM patients have poor awareness of diabetes, self-management ability, and blood sugar control, and the speed of role transition. There are different (Huang, M., Zhao, R., Li, S., et al., 2014; Ji, J.-J., Liu, L., Lou, Q.-Q., et al., 2014; Zhao, F., Yuan, L., Lou, Q.-Q., et al., 2013). This study was carried out in order to rapidly switch roles in newly diagnosed T2DM patients and improve treatment compliance.

Nursing staff play a vital role in health education as the patient's primary assessor, planner, and implementer during a diabetic hospital stay. At present, the nurse-led nursing model has been widely used in other medical nursing specialties, but it has not been applied to newly diagnosed type 2 diabetes patients. A large number of studies have shown that the nurse-led nursing model is conducive to improving the clinical outcomes of patients and saving medical resources. It is a scientific and effective nursing model and is worthy of promotion in clinical practice (Guo, Y., 2021; Jiang, Q.-P., 2021).

Evidence-Based Nursing (EBN) refers to nursing staff's careful, clear and judicious integration of scientific findings with their clinical experience and patients' wishes in planning their nursing activities to obtain evidence as a basis for clinical nursing decisions. Process (Hu, Y., 2019). The early stage of diabetes diagnosis is a critical period for diabetes treatment. Incorporating evidence-based nursing into the intervention measures for newly diagnosed type 2 diabetes patients is of great significance to its treatment.

2. Materials and Methods

2.1 Normal Information

Convenience sampling method was adopted, and 42 patients with initial diagnosis of T2DM who were admitted to the endocrinology department of a tertiary hospital in Chifeng City from September 2021 to February 2022 were included in the study. The random number table method was used for grouping, and finally 21 cases were included in the control group and 21 cases in the experimental group. There were 13 males and 8 females in the control group; the age ranged from 26 to 52 years old, with an average of (37.95 ± 7.59) years old. The experimental group consisted of 12 males and 9 females; the age ranged from 22 to 51 years, with an average of (38.62 ± 7.37) years. There was no significant difference in gender and age between the two groups $(P>0.05)$, and they were comparable.

Inclusion criteria of the research subjects: 1)Meet the 1999 WHO diagnostic criteria for diabetes: the plasma glucose concentration of patients at any time of the day is ≥ 11.1 mmol/L, or the plasma glucose concentration after fasting for at least 8 hours is ≥ 7.0 mmol/L (Sun, X., 2017); 2)The initial diagnosis of T2DM, duration of diabetes ≤ 12 months (Zhang, X.-P., 2014); 3)Those with good vision, hearing and communication skills; 4)Those who voluntarily participated in this study and filled out the informed consent form.

Exclusion criteria: 1)Type 1 diabetes or other types of diabetes; 2)Complicated with severe heart, kidney, brain, foot, eye and nervous system complications; 3)Received diabetes-related treatment and care before this admission; 4)Participating in other research projects of patients.

2.2 Methods

2.2.1 Control Group

Taking traditional health education on diabetes, the main contents are:

(1) Assess the basic situation of the patient: After the doctor confirms that the patient is newly diagnosed with type 2 diabetes, within 24-48 hours after the patient is admitted to the hospital, the nurse will conduct an initial assessment of the patient, fill in the relevant questionnaire, and complete the collection of baseline data;

(2) Distribute the diabetes health education manual in our hospital and instruct patients to read it; nurses provide basic diabetes health education to patients, explain in detail the specific content of the "five carriages" of diabetes health management, and emphasize the effects of diet, exercise, drugs, and emotions on the influence of blood sugar control, and patiently answer the questions raised by patients;

(3) Nurses strictly monitor the fasting blood glucose and 2-hour postprandial blood glucose levels of patients.

2.2.2 Test Group

Employ nurse-led, evidence-based care that includes:

(1) Ask evidence-based questions: formulate structured care questions based on the patient's situation and in conjunction with the PIPOST principles;

(2) Summarize the best evidence: formulate a retrieval strategy, perform retrieval in databases such as CNKI, Wanfang, VIP, and pubmed, and integrate scientific and reasonable evidence-based nursing plans based on the retrieval results;

(3) Set up an evidence-based nursing team: The team members include 2 nursing graduate tutors, 1 nursing graduate student, 1 head nurse in the endocrinology department, 1 diabetes specialist nurse, 2 endocrinology nurses, and 1 nutritionist. All members should focus on learning and training before implementing nursing measures, and be able to master the content, process, assessment tools, etc. of this research;

(4) Clinical application:

a) Health education: adopt a combination of various educational methods. First, the nurses improved the patients and their families' superficial awareness of type 2 diabetes through oral explanations, distributing the diabetes health education manual in our hospital, and explaining the specific content of the manual to the patients. Secondly, arrange a diabetes-related knowledge lecture once a week to focus on popularizing diabetes-related

knowledge. The content of the lecture is fixed and the venue is fixed. Through circulating the content of diabetes health education, it can not only help patients understand and master diabetes-related knowledge, but also accept newly admitted patients at any time.

b) Dietary guidance for diabetes: According to the rule of hand measurement and exchange of food, "Chinese Diabetes Medical Nutrition Treatment Guidelines (2013 Edition)" (Diabetes Branch of Chinese Medical Association, Nutritional Physician Professional Committee of Chinese Medical Doctor Association, 2015) and "Chinese Residents' Dietary Guidelines (2016)", and in the guidance of the nutrition department of our hospital and Under the supervision of health managers, individualized dietary prescriptions were formulated and implemented for the subjects in the intervention group. During hospitalization, nurses need to teach patients or their families how to calculate total calories, exchange portions of food, and explain the general principles of meal catering and the correct use of palm method. Individualized dietary management plan cards were issued to patients, instructing patients to correctly calculate and fill in basic information, and jointly formulate specific dietary plans with patients and their families.

c) Diabetes exercise guidance: The nurse teaches the patient to correctly judge the appropriate exercise method, intensity and time. First of all, due to the limitations of the venues and sports facilities in the hospital ward, and the need to comply with the hospital's relevant principles for preventing the new coronary pneumonia epidemic, this study recommends that patients take walking as the exercise program because it is simple, easy to do, does not require exercise equipment, and has no Requirements for special sports venues (Niu, Y.-L., 2015). Secondly, in order to achieve the effect of exercise, in addition to the warm-up time before exercise and the buffer time after exercise, it needs to be 20-40 minutes each time. 3-5 times a week, the interval between each exercise should not exceed 48 hours (Liu, M., 2020). Finally, diabetic patients should not exercise on an empty stomach and should exercise 1-2 hours after meals. Monitor the blood sugar of patients with type 2 diabetes after three meals, find out the time of day when the highest blood sugar value is most likely to occur, and exercise after this time period (Chen, D.-M., 2009).

d) Guidelines for the management of diabetes medication (Liu, L.-C., 2020): If the patient needs to take oral medication to treat type 2 diabetes as prescribed by the doctor, the nurse will explain to the patient the correct taking time, accurate dosage, common adverse reactions of the medication, and the occurrence of hypoglycemia. symptoms and treatment methods. If the patient needs to use an insulin pen to treat type 2 diabetes as prescribed by the doctor, the nurse should instruct the patient to relax before injecting insulin, so that the muscles are relaxed for the injection; during the injection process, the correct injection site and injection method are explained, and the patient is encouraged to do it by himself. Correct the incorrect parts in the injection process in time; after the injection, remove the needle and cover the pen cap to prevent the contamination of the liquid and the failure of the liquid. At the same time, inform the patient about the preservation of insulin, the replacement method of the insulin pen needle, the symptoms and treatment methods of hypoglycemia, etc.; for the older, inconvenient, and blurred type 2 diabetic patients, guide their primary caregivers to master insulin. Knowledge about injections. Emphasize to the patients and their families the necessity of taking the medicine on time and in the amount according to the doctor's advice.

e) Psychological care: Nurses teach patients effective techniques to relieve psychological stress, such as deep breathing, listening to music, and doing things they like to divert their attention. Educate the patient's family members to provide psychological support for the patient, provide treatment assistance and assist in monitoring the condition, so as to help the patient establish the confidence to overcome diabetes. For patients with no obvious effect of the above measures and excessive psychological burden, drug intervention should be carried out according to the doctor's advice if necessary.

2.3 Observation Index

The blood sugar control, self-management behavior and nursing satisfaction of the diabetic patients in the experimental group and the control group were statistically analyzed. Blood sugar control includes fasting blood sugar level and 2 h postprandial blood sugar level. Type 2 Diabetes Self-Care Scale (DSCS) has a total of 26 items, reflecting six aspects of diabetes management, including diet management, exercise management, medication management, blood glucose monitoring, foot care, and management of high and low blood sugar. Self-managing content. The scale adopts Likert 5-level scoring method. Since the number of items in each dimension is different, in order to make each dimension comparable, the average score (actual score/number of items) is used for comparison. The higher the score, the better the self-management behavior (Wang, J.-Q., & Liu, M., 2003; Shi, L.-G., Wu, Y.-P., Zhang, L.-F., et al., 2010) Nursing satisfaction is divided into very satisfied, basic satisfaction and dissatisfaction, of which very satisfied + basic satisfaction = total satisfaction (Gan, Y.-P.,

Chen, L., Wei, X.-D., et al., 2019).

2.4 Statistical Analysis

SPSS 26.0 statistical software was used for statistical processing. Qualitative data were described by frequency and percentage, and quantitative data were described by mean $\pm$ standard deviation (x$\pm$s), which did not obey normal distribution, and were described by median (interquartile range) and range. In this study, two independent samples t-test or t' test was used for fasting blood glucose, 2-hour postprandial blood glucose, and type 2 diabetes self-management behavior scale; χ^2 test was used for nursing satisfaction of two groups of patients.

3. Results

3.1 Comparison of Blood Glucose Levels in the Two Groups of Patients

The results of the study showed that the control levels of fasting blood glucose and blood glucose two hours after meals in the experimental group were significantly better than those in the control group, and the difference was statistically significant (P<0.05).

Table 1. Comparison of blood glucose levels before and after intervention (x$\pm$s)

group	n	fasting blood sugar (mmol/L)	blood sugar two hours after meals (mmol/L)
test group	21	11.42$\pm$2.79	17.36$\pm$3.07
control group	21	14.82$\pm$1.38	25.10$\pm$2.07
t		-4.99	-9.57
P		<0.001	<0.001

3.2 Comparison of Self-Management Behaviors of Two Groups of Patients

The results showed that the self-management ability of the patients in the experimental group was higher than that in the control group, and the difference was statistically significant (P<0.05).

Table 2. Comparison of self-management behaviors (x$\pm$s)

group	sports	diet	medication	blood sugar monitoring	foot care	High and low blood sugar management	total Score
test group	18.49$\pm$1.03	28.57$\pm$1.37	14.48$\pm$0.66	18.84$\pm$0.82	23.85$\pm$1.13	19.10$\pm$0.87	123.47$\pm$2.66
control group	14.36$\pm$1.30	24.50$\pm$1.22	12.68$\pm$1.19	15.56$\pm$0.90	18.62$\pm$1.19	14.45$\pm$1.35	100.17$\pm$3.01
t	44.87	41.12	23.60	49.53	58.59	51.74	105.84
P				<0.001			

3.3 Comparison of Nursing Satisfaction of Two Groups of Patients

The results of the study showed that the nursing satisfaction of patients in the experimental group was higher than that in the control group, and the difference was statistically significant (P<0.05).

Table 3. Comparison of nursing satisfaction [n (%)]

group	n	very satisfied	basically satisfied	dissatisfied	total satisfaction
test group	21	14(66.6%)	5(23.8%)	2(9.5%)	19(90.5%)
control group	21	6(28.5%)	7(33.3%)	8(38.1%)	13(61.9%)
χ^2					7.133
P					0.028

4. Discussion

The high incidence of diabetes is a serious threat to human health. According to the statistics of the International Diabetes Federation in 2017, my country is the country with the largest number of people with diabetes in the world. There are about 114 million people with diabetes, and about 70% of them are newly diagnosed with diabetes (International Diabetes Federation, 2017; Cheng, H., & Jia, W.-P., 2018; Guang, N., & Zachary, B., 2013). Diabetes mellitus is a serious and progressive disease. Once diagnosed, it requires life-long management and treatment, which will bring a heavy burden to the patients themselves, their families and the whole society. Especially for patients diagnosed with type 2 diabetes for the first time, they rely on hypoglycemic drugs to directly intervene and control blood sugar when receiving treatment for the first time, and the awareness rate of diabetes-related knowledge is low, so there are many misunderstandings about diabetes. Therefore, it is imperative to strengthen health education for newly diagnosed T2DM patients.

There are many problems in the routine clinical care of diabetes in my country. First, health education is mediocre, verbal, and not comprehensive and systematic (Zhang, B.-W., Zhou, Q.-H., Tong, F.-F., et al., 2017); secondly, the knowledge needs of patients cannot be accurately grasped in nursing measures, especially for For patients newly diagnosed with type 2 diabetes, although some patients have mastered the principles of type 2 diabetes diet and exercise, they do not know how to apply them to real life (Yang, L.-Q., Gong, Y., Zhang, X., et al., 2015).

Evidence-Based Nursing implements nursing actions based on summarizing the best evidence by asking evidence-based nursing questions. At the same time, an evidence-based nursing team is established, led by nurses, to understand the changes of patients' conditions in a timely manner, and to better serve patients. The above research results show that nurse-led evidence-based nursing can effectively control blood sugar levels, improve patients' self-management ability and nursing satisfaction, and is worthy of clinical application.

References

Chen, D.-M. (2009). The training principles of exercise therapy for type 2 diabetes mellitus (NIDDM). *Journal of Harbin Institute of Physical Education, 27*(5), 92-97.

Cheng, H., & Jia, W.-P. (2018). Diabetes in China: Epidemiology and Genetic Risk Factors and Their Clinical Utility in Personalized Medication. *Diabetes, 67*(1), 3-11.

Diabetes Branch of Chinese Medical Association, Nutritional Physician Professional Committee of Chinese Medical Doctor Association. (2015). Guidelines for Nutritional Treatment of Diabetes Medicine in China (2013). *Chinese Journal of Diabetes, 7*(2), 73-88.

Gan, Y.-P., Chen, L., Wei, X.-D., *et al.*. (2019). Effect of evidence-based nursing on the quality of life of patients with diabetic retinopathy. *Chinese Journal of Modern Nursing, 25*(8), 1026-1029.

Guang, N., & Zachary, B. (2013). Diabetes in China: Prevalence, diagnosis, and control. *Journal of Diabetes, 5*(4).

Guo, Y. (2021). Research on the construction of a nurse-led perioperative blood glucose management plan for cardiac surgery. *Huzhou Teachers College*.

Hu, Y. (2019). *Evidence-Based Nursing* (2nd ed.). Beijing. People's Health Publishing House.

Huang, M., Zhao, R., Li, S., *et al.*. (2014). Self-management behavior in patients with type 2 diabetes: a cross-sectional survey in westem urban China. *PLoS One, 9*(4), 138.

International Diabetes Federation. (2017). *IDF Diabetes Atlas* (8th ed.).

Ji, J.-J., Liu, L., Lou, Q.-Q., *et al.*. (2014). Research on self-management behavior and blood sugar control status of patients with type 2 diabetes. *Chinese Journal of Nursing, 49*(5), 617-620.

Jiang, Q.-P. (2021). Application of nurse-led early activity program in ICU patients. *Nanchang University.* https://doi.org/10.27232/d.cnki.gnchu.2021.001107

Liu, L.-C. (2020). The influence of health education on the compliance of various indicators and blood sugar control in diabetes nursing home for diabetic patients. *China Practical Medicine, 15*(15), 178-180.

Liu, M. (2020). Construction of a walking function exercise program for elderly patients with type 2 diabetes. *Anhui Medical University.*

Niu, Y.-L. (2015). Research on personalized plan of exercise therapy for patients with type 2 diabetes. *Harbin Institute of Physical Education.*

Shi, L.-G., Wu, Y.-P., Zhang, L.-F., *et al.*. (2010). Study on the correlation between self-management behavior and enthusiasm in patients with type 2 diabetes. *Journal of Nursing, 25*(5), 10-12.

Sun, X. (2017). Changes in the diagnosis of GDM. *Chinese Journal of Practical Rural Doctors, 24*(8), 6-7.

Wang, J.-Q., & Liu, M. (2003). Study on the correlation between self-efficacy and self-care behavior in adult non-insulin-dependent diabetic patients. *Chinese Journal of Nursing, 38*(6), 429-431.

Yang, L.-Q., Gong, Y., Zhang, X., *et al.*. (2015). Status and progress of health education for patients with diabetes in China. *Qilu Nursing Journal, 21*(3), 50-53.

Ye, R.-G., & Lu, Z.-Y. (2006). *Internal Medicine* (6th ed.). Beijing: People's Medical Publishing House, 787.

Zhang, B.-W., Zhou, Q.-H., Tong, F.-F., *et al.*. (2017). Current status of health education for diabetic patients. *Journal of Practical Clinical Nursing, 44*(2), 195-197.

Zhang, X.-P. (2014). *Prevention and Nursing of Geriatric Diseases.* Shanghai: Shanghai Jiaotong University Press, 12.

Zhao, F., Yuan, L., Lou, Q.-Q., *et al.*. (2013). Study on the correlation between health education and blood sugar control and self-care behavior in patients with type 2 diabetes mellitus. *Chinese Journal of Diabetes, 5*(10), 598-603.