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A Study of Comprehensive Care Interventions Received by Patients with T2DM to Improve Compliance and Satisfaction Rates

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Abstract: *Type 2 diabetes mellitus (T2DM) is a kind of chronic metabolic disease, which is caused by insufficient insulin secretion or cell resistance to insulin, but more and more young people are being diagnosed. Type 2 diabetes can be managed by controlling diet, exercise, medication, and monitoring blood glucose levels, and timely adjustment of treatment and management can help prevent complications, and improve the quality of life of patients. Comprehensive Nursing is a coordinated, comprehensive, systematic and continuous nursing mode with patients as the center. The service includes many aspects, such as body, psychology and society, etc., it involves the application of comprehensive nursing care in type 2 diabetes mellitus patients from the aspects of disease prevention, disease evaluation, nursing intervention, rehabilitation and disease management, etc., it can also prevent complications and promote rehabilitation. This article studies the effect of comprehensive nursing on the compliance and satisfaction rate of patients with type 2 diabetes mellitus.*

Keywords: *satisfaction rate; comprehensive care; adherence; diabetes mulltitus, type 2; blood glucose level*

1. Introduction

T2MD (type 2 diabetes mellitus) is an endocrine disease, the cause of which is the relative or absolute insufficiency of insulin secretion, and patients usually need long-term insulin injections or medication to effectively control their blood glucose. Clinical investigation found [1] that most patients with T2MD lack knowledge about their disease and medication, and their compliance with medication is not high, which often leads to poor control of the disease. It is worth noting that long-term medication in diabetic patients can affect their emotions and produce negative emotions such as depression and anxiety, increasing the incidence of insomnia which in turn can affect blood glucose changes, aggravating the diabetic process and reducing the quality of life of patients. Therefore, in order to improve the clinical efficacy and sleep status of type 2 diabetic patients, it is necessary to supplement the treatment with comprehensive nursing interventions. Comprehensive care is a holistic care model that enables the patient's condition to be controlled and the quality of life to be improved by understanding the patient's condition needs and developing a comprehensive care service plan. A study of 88 patients with T2DM in our hospital from April 2020 to August 2022 was conducted to explore the value of the application of integrated nursing care, which is summarized below.

2. Information and methods

2.1. General data

The study population was 88 patients with T2DM, and the cases were selected from April 2020 to August 2022. Grouping was performed by the completely randomized design method, and the ratio of men to women in the control group (n=44) was 25:19, and their ages were from 35 years old to 68 years old, in an average of (46.85±4.29) years old; and their duration of disease ranged from 1 to 7 years, in an average of (4.58±1.64) years. The ratio of men to women in the experimental group (n=44) was 27:17, and their ages were from 36 years old to 66 years old, in an average of (46.71±4.34) years old; and their duration of disease ranged from 2 to 6 years, in an average of (4.49±1.72) years. Comparing the conventional data of the two groups revealed that there was no statistical value ($P > 0.05$), satisfying the requirement of low variability in the general data of the study subjects.

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Inclusion criteria: (1) Patients were diagnosed with T2DM, consistent with the relevant diagnostic criteria in *Chinese Guidelines for Type 2 Diabetes* [2]; (2) Patients with normal communication skills and clear consciousness; (3) Patients had the right to information and signed consent; (4) The study followed the guidelines of the *Declaration of Helsinki*.

Exclusion criteria: (1) Patients with malignancy or severe infection; (2) Patients with cerebrovascular disease; (3) Patients with coagulation or immune dysfunction; (4) Patients with diabetic complications.

2.2. Methods

The control group was given conventional care: closely monitoring the patients' blood glucose level and instructing them to use the medication reasonably; answering the patients' questions and eliminating their worries; encouraging the patients to carry out more appropriate exercise training to enhance their physical fitness; instructing the patients to eat scientifically and keeping enough rest every day.

In the experimental group, comprehensive care was given:

(1) Enhanced Health Education: Through the distribution of health manuals, send wechat videos and other ways to patients, family members to carry out health education, By issuing health manual, send WeChat video methods such as health education on patients, family members, in order to improve the understanding of the disease;Setting individualized schedule, To help patients develop scientific sleep habits. For patients who cannot fall asleep, interesting radio or soft music can be played to promote sleep.

(2) Strengthening psychological care: Actively communicate with patients, to introduce patients to the ideal case of disease control, enhance their treatment confidence. And patients' psychological burden can be reduced by communicating close with their family members and instructing them to be more caring and sympathetic.

(3) Diet and exercise intervention: the patient's diet should be controlled, especially caloric intake; the patients and their family members should be informed of the key points of diet and the nutrients contained in food, which is easy to digest and contains less fat and salt. Patients should do some aerobic training such as walking and jogging to increase insulin sensitivity and thus glucose tolerance can be improved.

(4) Complication prevention: hypoglycemia can be prevented during care, the stability of blood glucose index can be maintained through reasonable extra meal; diabetic ketoacidosis and other conditions can be effectively prevented; skin care should be implemented, observation should be strengthened and some massage care should be appropriately carried out to prevent long-term pressure on local tissues; patients dhoulf be assisted to change positions from time to time to improve physical comfort.

(5) Behavioral interventions: relaxation methods should be taught to patients and they are allowed to relieve psychological pressure by listening to music and reading books, so as to reduce the adverse effects of negative emotions. In addition, patients can be instructed to choose the most restful position for deep breathing relaxation training in a quiet environment, relaxing their body and mind when inhaling, forgetting the stress of life and work, and focusing on deep breathing. When training, they should control the rhythm, feel the breath from the nasal cavity to the throat then fully concentrated in the lungs, wait for the lungs to expand, and then slowly exhale to expel the gas in the lungs as much as possible; the patients can be also guided to perform whole-body segmentation muscle exercise to eliminate the sense of tension in the organism and relieve stress.

(6) Medication care: the doctor's prescription should be strictly follow to guide the patient's medication, the patients should be informed of the method of insulin use and injection dose, including the dose of oral medication, etc., to prevent accidents caused by insulin use or medication overdose. During the patient's medication, nursing staff should also closely monitor the patient to prevent adverse manifestations, and if the patient develops abnormalities, it should be reported to the doctor immediately and effective treatment should be given.

(7) Sleep care: as far as possible, nursing operations should be carried out during the daytime when the patient is naturally awake, and only floor lights should be turned on at night; patients should be instructed to sleep for no more than 1 hour during the day and to fall asleep regularly at night to

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establish regular sleep habits; to improve the quality of sleep, patients can be instructed to drink a glass of hot milk before they fall asleep, or to promote sleep by soaking their feet in warm water.

(8) Discharge guidance: when patients are discharged from the hospital, they should be provided certain guidance, informed of matters related to home medication, diet and exercise, their questions should be answered, and they should be instructed to develop good work and rest habits, strengthen their diet and nutrition, and maintain optimism; if there are any abnormalities, they should return to the hospital for review in a timely manner.

2.3. Observation indexes

(1) Comparison of blood glucose levels between the two groups: the patients' blood glucose levels were measured before and after care, and the main indexes were 2-hour postprandial glucose (2hPG), fasting plasma glucose (FPG) and glycosylated hemoglobin (HbAlc).

(2) Comparison of medication adherence between the two groups: evaluation was performed by MMAS-8 [3], which is a questionnaire with a total score of 8. Low adherence: <6; fair adherence: 6-7; high adherence: 8. Scores and the adherence were positively proportional.

(3) Comparison of the psychological status of the two groups: a. The anxiety status was determined by SAS, which has 20 items with the threshold of 50, mild score of 59-50; moderate score of 69-60; and severe score of ≥70. b. The depression status was assessed by SDS, which has 20 items with the threshold of of 53, mild score of 62-53; moderate score of 72-63; severe score was ≥73.

(4) Comparison of sleep quality between the two groups: sleep quality was assessed by the PSQI [4], which has 7 evaluation indexes and is rated according to a four-level scoring scale (0-4) with a score range of 0-21, and higher scores indicate more severe insomnia symptoms.

(5) Comparison of complications between the two groups: the occurrence of nephropathy, vascular lesions and other lesions during the care period was recorded.

(6) Comparison of the satisfaction rate of the two groups: the satisfaction rate was investigated by nursing questionnaire scale, which included service attitude, operation level and hospitalization environment, etc. The full score was 100, ≥90 is very satisfied; 89-60 is satisfied; <60 is unsatisfied.

2.4. Statistical methods

The software SPSS 23.0 was selected to implement statistical analysis, ($\bar{x} \pm s$) was the measurement data, verified by t, and the rate (%) was the count data, verified by $\chi 2$. If the results suggested that $P < 0.05$, it meant that the difference was statistically significant.

3. Results

3.1. Blood glucose level

Compared with that before care, the blood glucose level after care decreased significantly in both groups, and the experimental group was significantly lower than the control group, with an obvious difference ($P < 0.05$). See Table 1.

Table 1: Comparison of blood glucose levels between the two groups ($\bar{x} \pm s$)

Groups	2hPG(mmol/L)		FPG(mmol/L)		HbAlc(%)	
	Before care	After care	Before care	After care	Before care	After care
Control group(n=44)	12.35±1.28	8.30±1.27*	8.86±1.25	6.62±1.17*	8.79±1.22	6.21±0.72*
Experimental group(n=44)	12.41±1.32	6.86±1.18*	8.88±1.23	6.01±1.02*	8.81±1.27	5.83±0.60*
t	0.216	5.510	0.076	2.607	0.075	2.689
P	0>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Note: compared with care, $P < 0.05$; 2hPG (2-hour postprandial glucose); FPG (fasting plasma glucose); HbAlc (glycosylated hemoglobin)

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3.2. Adherence

Compared with that before care, the MMAS-8 scores of both groups significantly improved after care, and the experimental group was higher than the control group, which was statistically significant (P < 0.05). See Table 2.

Table 2: Comparison of adherence scores between the two groups ($\bar{x} \pm s$, scores)

Groups	Before care	After care	t	P
Control group(n=44)	4.26±1.14	6.86±1.10	10.887	<0.05
Experimental group(n=44)	4.30±1.08	5.43±0.97	5.163	<0.05
t	0.169	6.468		
P	>0.05	<0.05		

3.3. Psychological status

Compared with that before care, the psychological state scores of both groups were significantly reduced, and the experimental group was significantly lower than the control group, with significant differences (P < 0.05). See Table 3.

Table 3: Comparison of psychological status between the two groups ($\bar{x} \pm s$, scores)

Groups	SAS		SDS	
	Before care	After care	Before care	After care
Control group(n=44)	50.50±7.25	41.25±7.88#	52.98±12.28	45.06±9.27#
Experimental group(n=44)	50.46±7.30	32.85±7.70#	52.76±12.34	38.61±9.38#
t	0.026	5.057	0.084	3.244
P	>0.05	<0.05	>0.05	<0.05

Note: compared with that before care, P < 0.05; SAS (Self-rating Anxiety Scale); SDS (Self-rating Depression Scale)

3.4. Sleep quality

Compared with that before care, the total PSQI score was significantly lower in both groups, and the experimental group was significantly lower than the control group, with a significant difference (P < 0.05). See Table 4.

Table 4: Comparison of sleep quality between the two groups ($\bar{x} \pm s$, scores)

Groups	Before care	After care	t	P
Control group(n=44)	14.28±1.24	8.16±1.44	21.362	<0.05
Experimental group(n=44)	14.30±1.20	3.59±1.08	44.004	<0.05
t	0.077	16.841		
P	>0.05	<0.05		

3.5. Complication

There were 7 cases of complications in the control group, with a total incidence of 15.91%; there was 1 case of complications in the experimental group, with a total incidence of 2.27%, and the comparison between the two groups was statistically significant (P < 0.05). See Table 5.

Table 5: Comparison of complications between the two groups [n (%)]

Groups	Numerical value(n)	Renal disease	Vascular disease	Other disease	Total incidence
Control group	44	0(0.00)	1(2.27)	0(0.00)	1(2.27)
Experimental group	44	2(4.55)	4(9.09)	1(2.27)	7(15.91)
χ^2					4.950
P					<0.05

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3.6. Satisfaction rate

The overall satisfaction rate of the experimental group was 95.45%, which is higher than the rate 77.27% of the control group, and the difference was statistically significant ($P < 0.05$). See Table 6.

Table 6: Comparison of satisfaction rates between the two groups [n (%)]

Groups	Numerical value(n)	Very satisfied	Satisfied	Dissatisfied	Total satisfaction rate
Control group	44	22(50.00)	12(27.27)	10(22.73)	34(77.27)
Experimental group	44	26(59.09)	16(36.36)	2(4.55)	42(95.45)
χ^2					6.175
P					<0.05

4. Discussion

T2DM is a chronic lifelong disease, the pathogenesis of which has not been completely clarified, and most studies suggest that its occurrence is related to diet and poor lifestyle habits. In recent years, the incidence of T2DM has been increasing year by year with the advancement of aging, and once the disease is diagnosed, patients need to receive long-term treatment to reasonably control blood glucose and inhibit the development of the disease.The treatment of T2DM is chronic and long-term. In order to effectively control blood glucose, the implementation of nursing services is also extremely necessary. Clinical studies have found that scientific nursing services applied to diabetic patients can not only enhance the effect of blood glucose level control, but also help patients develop good living and eating habits and master certain self-management abilities, thus improving sleep quality and quality of life.

In this study, compared with the control group after nursing, the experimental group had significantly higher medication compliance and satisfaction rate, and significantly lower blood glucose level, psychological state and PSQI score and complications (all $P < 0.05$), indicating that comprehensive care has a positive impact on the improvement of medication compliance of patients with T2DM, which can increase patients' recognition of nursing services, and also can reasonably regulate blood glucose level and improve patients' psychological state . The presumed reasons are:

(1) Enhanced health education in comprehensive care can make up for the shortage of conventional health education and help patients deepen their knowledge of the disease, so that they can pay attention to their condition and actively cooperate with doctors in medication administration.

(2) Enhanced psychological care helps nursing staff to comprehensively understand patients' care needs and grasp their psychological status, so that they can take individualized measures to help patients improve their state of mind and increase their satisfaction with nursing care.

(3) Diet and exercise care are assistant therapies, among which diet care can improve nutritional deficiency and prevent complications, as well as improve metabolism in the long term and slow down disease development; exercise care can reduce insulin resistance, improve body composition and reduce cardiovascular risk factors.

(4) Complication prevention can reduce the risk of complications, maintain patients' physical health, and protect them from other diseases.

(5) Behavioral interventions can increase patients' cognitive ability of reality, change their denial of their surroundings, self and future, thus alleviating the psychological stress caused by abnormal emotions, and ultimately improving depression and anxiety; in addition, behavioral interventions can guide patients to reasonably adjust their daily behavior and psychological state according to the development of their illness, learn self-management, and enable long-term and effective control of blood glucose levels.

(6) Medication care can help patients establish health beliefs, inhibit the occurrence of acute and chronic complications, and improve their health awareness; in addition, it can improve patients' medication compliance, reduce adverse reactions, and enhance the effectiveness of blood glucose control.

(7) Sleep care: Most patients with T2DM are affected by anxiety, depression and other negative emotions, and are prone to sleeping difficulties, which will lead to insomnia if not taken seriously; the

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type 2 diabetes patients' lack of sleep for a long time cannot meet their physiological needs, and their mental state will be influenced; in addition, the lower quality of sleep will also affect blood glucose levels and cause disorders of lipid metabolism. Sleep care can meet patients' needs for physical comfort, reduce their psychological pressure, help them get out of their depressed state, create a good sleep environment, and thus improve sleep quality.

(8) Discharge guidance can enable patients and their family members to grasp basic nursing knowledge and understand the importance of self-monitoring of blood glucose at home, thus improving patients' self-management ability, health level and quality of life. Integrated nursing follows the modern concept of nursing service with systematic and standardized features, which can ensure the standardization of service processes and interlocking nursing settings. It requires nursing staff to constantly update their service concepts and methods and improve their own service level, so that patients' needs in various aspects, such as illness, emotion, psychology and society, can be met, thus increasing patients' reliance on and recognition of medical and nursing staff and promoting the smooth development of nursing career development. Therefore, the application of integrated care in the care of patients with T2DM can clarify the responsibilities of each nursing staff and provide patients with consistent and high-quality nursing services by strengthening health education, psychological care and complication prevention interventions, so that patients can build up confidence in overcoming the disease and return to a normal state as soon as possible.

5. Conclusion

To sum up, comprehensive care received by patients with T2DM has definite effects, which can regulate blood glucose level, improve patients' medication compliance and sleep quality, and also eliminate negative emotions, reduce complications, and make the nurse-patient relationship more harmonious.

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