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Article

Clinical Efficacy of Continuous Nursing Plus Shared Outpatient Care on Remission of Type 2 Diabetes Mellitus

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Abstract

Aims/Background: Type 2 diabetes mellitus (T2DM) is one of the most prevalent chronic metabolic disorders with a gradually increasing global incidence, imposing healthcare burdens on patients. Effective long-term management strategies are crucial for improving patient outcomes and promoting disease remission. Therefore, this study aims to evaluate the efficacy of continuing care services combined with the shared outpatient management model in patients with T2DM. **Methods**: This retrospective cohort study included 119 patients with T2DM who received treatment and follow-up consultation at Cangnan Hospital of Wenzhou Medical University between January 2024 and December 2024. According to the different nursing methods used, patients were divided into a control group (n = 60, conventional T2DM management) and an observation group (n = 59, conventional T2DM management combined with continuous nursing and shared outpatient management). Continuing care service refers to follow-up and health education that extends from the hospital to the home. At the same time, the shared outpatient management model involves regular group visits that facilitate experience sharing and peer support among patients under multidisciplinary guidance. Clinical indicators, such as fasting blood glucose, 2-hour postprandial blood glucose, fasting C-peptide, 2-hour postprandial C-peptide, body mass index (BMI), glycated hemoglobin A1c (HbA1c), and disease remission rate, were compared between the two groups. Self-management behavior skills were evaluated across five key domains, including exercise, diet, foot care, blood glucose monitoring, and medication adherence. **Results**: At 3 and 6 months after intervention, patients in the observation group demonstrated significant improvements in several metabolic indicators compared to those in the control group. Specifically, fasting blood glucose and 2-hour postprandial blood glucose were significantly decreased in the observation group ($p < 0.05$). Furthermore, fasting C-peptide, 2-hour postprandial C-peptide, BMI, and HbA1c were significantly improved in the observation group at 3- and 6-month follow-up time points ($p < 0.05$). The self-management behavior assessment revealed that the total median score and scores for exercise, diet, foot care, blood glucose monitoring, and medication compliance were all significantly higher in the observation group than in the control group (all $p < 0.05$). The diabetes remission rate was 20.339% (12/59) in the observation group, which was significantly higher than 6.667% (4/60) in the control group ($p = 0.029$). **Conclusion**: The continuing care service combined with a shared outpatient management model can effectively improve the blood glucose control, islet function, and metabolic indicators in T2DM patients, and enhance their self-management ability, highlighting a positive clinical value of this integrated approach in promoting diabetes remission rates.

Keywords: type 2 diabetes mellitus; patient care continuity; remission induction; self-management

1. Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disease caused by both genetic and environmental factors. It is characterized by insulin resistance accompanied by a progressive decline in pancreatic β-cell function. In past decades, changes in lifestyle and diet structure have contributed considerably to increasing global prevalence of T2DM [1]. If not properly managed, T2DM can lead to serious complications, such as diabetic retinopathy, nephropathy, cardiovascular and cerebrovascular diseases [2]. These complications compromise physical health and impose substantial psychological burden and economic pressure on patients.

Traditionally, T2DM has been regarded as a disease that can be controlled but not permanently cured. In recent years, with the improvement of the cognitive level of T2DM and the progress of medical technology, researchers have established a novel method for the prevention and treatment of T2DM, that is, reversing T2DM, and have achieved positive results [3]. The American Diabetes Association (ADA) defines "diabetes remission" as managing glycated hemoglobin A1c (HbA1c) levels <6.5% for at least 3 months in the absence of antidiabetic drugs [4]. A study has found that without intensive blood glucose control within 1 year after diagnosis, the risk of both microvascular and macrovascular complications may continue to increase over the next 5 to 10 years, even if blood glucose control is subsequently improved, and early and proactive intervention can increase the remission rate of T2DM [5].

Patient's good compliance, disease management skills, and positive attitude towards the disease can be significantly linked with enhanced treatment outcomes and an increased likelihood of recovery [6]. Therefore, approaches that strengthen patient education, enhance knowledge updates, encourage peer support, and integrate comprehensive, multidisciplinary management are widely known as critical components of effective disease care [7]. A previous study have found that multidisciplinary continuous nursing interventions can effectively improve patients' compliance, support the shift in unhealthy lifestyle attitudes, encourage regular follow-up consultations, and improve self-care knowledge following comprehensive health education. Continuing nursing care provides professional support outside the hospital setting into the home environment of the patients. Continuing care service enables patients to access ongoing guidance and support through diverse out-of-hospital channels, helping them achieve consistent disease care [8].

Despite promising advantages, conventional care for T2DM remains limited due to time constraints. In clinical practice, the traditional "one-to-one" consultation model focuses mainly on medication and brief doctor's advice, offering an inadequate window for in-depth education regarding disease and long-term self-management. In contrast, the shared outpatient management model is an innovative approach to disease care. In this model, patients participate in extended team-based counseling where patients receive detailed knowledge about T2DM management, participate in discussions between doctors and other patients, and share treatment experiences with other patients facing similar complications [9]. This method is conducive to improving the lifestyle of patients and establishing a good disease management system.

Given the disease background, this study aims to systematically evaluate the clinical efficacy of continuing care services combined with a shared outpatient management model for patients with T2DM. Specifically, it assesses its effect on the remission rate of T2DM and explores its impact on crucial metabolic indicators and self-management behaviors. By evaluating these outcomes, the study intends to provide a scientific basis for optimizing diabetes management strategies and promoting the practical implementation of remission-oriented care in clinical settings.

2. Methods

2.1 Study Participants

This retrospective cohort study recruited T2DM patients who underwent treatment at Cangnan Hospital of Wenzhou Medical University and attended regular follow-up visits between January 2024 and December 2024. Initially, 216 patients were screened. After applying the exclusion criteria, 97 patients were excluded for the following reasons: special types of diabetes (n = 18), autoimmune diabetes (n = 12), long disease duration or severe complications with poor pancreatic islet function (n = 42), and incomplete clinical data (n = 25). Finally, 119 eligible patients were included in the final analysis. According to the nursing method used during follow-up, patients were allocated to the following groups: a control group (n = 60) and an observation group (n = 59).

Inclusion criteria were as follows: (1) Patients aged 18–65 years diagnosed with diabetes duration of $\leq$5 years; (2) Body mass index (BMI) $\geq$25 kg/m^2, or waist circumference $>$90 cm in men or $>$85 cm in women; (3) Fasting C-peptide $\geq$1.1 ng/mL, and 2-hour postprandial C-peptide $\geq$2.5 ng/mL; (4) Negative results for glutamic acid decarboxylase antibodies (GADA) and other type 1 diabetes-associated antibodies; (5) Normal communication ability and self-care capability; (6) Complete clinical data and self-management assessment records at baseline and at least two follow-up visits (about 3 months and 6 months apart). Patients were excluded from the study cohort if they had (1) special types of diabetes, including hypercortisolism, growth hormone tumor, glucagonoma, and genetically predisposed cases; (2) autoimmune diabetes; (3) long disease duration, or severe complications with poor pancreatic islet function; and (4) incomplete clinical data.

2.2 Group Allocation and Interventions

Based on the type of nursing methods, patients were divided into the control group (n = 60) and the observation group (n = 59). Patients in the control group received standardized routine management for T2DM. In addition to routine T2DM management, patients in the observation group received continuous care services and a shared outpatient management model, allowing assessment of the incremental benefit of the enhanced support components.

2.3 Continuing Care Service Team and Intervention

The continuing care service team consisted of an endocrinologist, a diabetes specialist nurse, and a nutritionist. The head nurse served as the team leader and was responsible for overall nursing program management, staff coordination, and handling special situations. The in-charge nurse conducted telephone follow-up with patients after discharge. The first follow-up visit was conducted 2 weeks after discharge, followed by telephonic consultation every two weeks during the first 3 months. After 3 months, follow-up was conducted once a month.

Patients were advised to attend outpatient reevaluations during the first, third, and sixth months, where relevant specialists assessed related clinical indicators. The attending physician was responsible for the diagnosis and treatment decision and managed special clinical conditions in coordination with the nursing staff. When nurses encountered difficult-to-solve problems during telephone follow-up, they consulted the specialist physician for further guidance. During hospital visits, various laboratory assessments were conducted, including fasting blood glucose, 2-hour

Table 1. Comparison of baseline data between the two groups.

Variable	Control group	Observation group	Statistic	*p*-value
Age (years)	49.733 ± 10.111	51.356 ± 11.690	$t = -0.810$	0.419
Gender, n (%)			$\chi^2 = 1.605$	0.205
Male	35 (58.333)	41 (69.492)		
Female	25 (41.667)	18 (30.508)		
Smoking status, n (%)			$\chi^2 = 0.204$	0.651
No	34 (56.667)	31 (52.542)		
Yes	26 (43.333)	28 (47.458)		
Alcohol consumption, n (%)			$\chi^2 = 0.404$	0.525
No	37 (61.667)	33 (55.932)		
Yes	23 (38.333)	26 (44.068)		
Place of residence, n (%)			$\chi^2 = 0.024$	0.877
Urban	44 (73.333)	44 (74.576)		
Rural	16 (26.667)	15 (25.424)		
Type of medical insurance, n (%)			$\chi^2 = 0.784$	0.376
Urban employee basic medical insurance	36 (60.000)	40 (67.797)		
Others	24 (40.000)	19 (32.203)		
Presence of complications, n (%)			$\chi^2 = 0.117$	0.733
No	55 (91.667)	56 (94.915)		
Yes	5 (8.333)	3 (5.085)		
Course of disease (years)	2.850 ± 1.105	3.003 ± 0.975	$t = -0.802$	0.424
Fasting blood glucose (mmol/L)	8.758 ± 0.549	8.694 ± 0.639	$t = 0.580$	0.563
Postprandial blood glucose (mmol/L)	11.681 ± 1.020	11.825 ± 0.634	$t = -0.930$	0.354
Fasting C-peptide (ng/mL)	1.578 ± 0.237	1.588 ± 0.257	$t = -0.234$	0.815
Postprandial C-peptide (ng/mL)	4.738 ± 1.011	4.713 ± 1.101	$t = 0.127$	0.899
BMI (kg/m^2)	28.016 ± 2.445	28.346 ± 3.037	$t = -0.655$	0.514
HbA1c (%)	9.039 ± 0.508	8.863 ± 0.538	$t = 1.832$	0.069

Note: BMI, body mass index; HbA1c, glycated hemoglobin A1c. All continuous variables were normally distributed (as tested by the Shapiro-Wilk test, $p > 0.05$), and the *t*-test was used for comparison between groups.

postprandial blood glucose, HbA1c, fasting C-peptide, and 2-hour postprandial C-peptide levels.

Continuous nursing intervention includes: (1) Dietary guidance tailored to individual patient requirements. (2) Counseling on regular exercise and more frequent blood glucose monitoring. (3) Medication management and compliance guidance.

2.4 Shared Outpatient Management Model

The shared outpatient management model involved endocrinologists, diabetes specialist nurses, and nutritionists throughout the care program. Topics related to blood glucose management (such as diet, exercise, and drugs) were discussed among patients and between patients and medical staff. In the shared clinic, patients were mainly allowed to share their experiences and ideas, and medical staff and healthcare professionals provided supplementary information, clarification, or targeted explanations, when necessary, rather than giving extended lectures. This shared clinic and management format developed a supportive environment where patients could openly discuss their experiences, learn from one another, and gain practical problem-solving skills. Each session lasted approximately 60–90 minutes, with group sizes typically ranging from 8 to 12 patients to facilitate effective interaction and discussion. Sessions were conducted once per month during the intervention period.

2.5 Clinical Outcome Measures

The clinical indicators evaluated in this study included fasting blood glucose, 2-hour postprandial blood glucose, fasting C-peptide, 2-hour postprandial C-peptide, BMI, and HbA1c. Indicator control rates were defined as follows: fasting blood glucose (<6.1 mmol/L), 2-hour postprandial blood glucose (<8 mmol/L), and HbA1c (<6.5%). These stricter targets were selected because this study aimed to assess remission-oriented outcomes in early-stage T2DM patients with preserved islet function, and the HbA1c threshold of <6.5% is consistent with the ADA definition of diabetes remission. Diabetes remission was assessed according to the ADA criteria as HbA1c <6.5% maintained for at least 3 months after discontinuation of antidiabetic drugs [4]. Postprandial blood glucose and C-peptide were measured 2 hours after a standardized mixed meal to ensure consistency across all participants.

Table 2. Comparison of blood glucose, islet function, and BMI between the two groups.

Variable	Control group	Observation group	t	p-value
Fasting blood glucose (mmol/L)				
Baseline	8.758 ± 0.549	8.694 ± 0.639	0.580	0.563
3	7.007 ± 0.500*	6.519 ± 0.541*	5.105	<0.001
6	6.536 ± 0.538*#	6.263 ± 0.407*#	3.122	0.002
Postprandial blood glucose (mmol/L)				
Baseline	11.681 ± 1.020	11.825 ± 0.634	–0.930	0.354
3	9.375 ± 1.248*	8.735 ± 1.054*	3.021	0.003
6	8.578 ± 1.028*#	7.860 ± 0.609*#	4.644	<0.001
Fasting C-peptide (ng/mL)				
Baseline	1.578 ± 0.237	1.588 ± 0.257	–0.234	0.815
3	2.279 ± 0.395*	2.697 ± 0.554*	–4.735	<0.001
6	2.449 ± 0.461*#	2.965 ± 0.454*#	–6.162	<0.001
Postprandial C-peptide (ng/mL)				
Baseline	4.738 ± 1.011	4.713 ± 1.101	0.127	0.899
3	6.693 ± 1.356*	7.214 ± 1.305*	–2.133	0.035
6	7.827 ± 1.945*#	8.469 ± 1.167*#	–2.186	0.031
HbA1c (%)				
Baseline	9.039 ± 0.508	8.863 ± 0.538	1.832	0.069
3	7.149 ± 0.518*	6.922 ± 0.614*	2.179	0.031
6	6.912 ± 0.456*#	6.701 ± 0.592*#	2.171	0.031
BMI (kg/m^2)				
Baseline	28.016 ± 2.445	28.346 ± 3.037	–0.655	0.514
3	26.588 ± 1.692*	25.879 ± 1.923*	2.136	0.035
6	26.021 ± 2.108*	25.150 ± 2.399*	2.105	0.037

Note: BMI, body mass index; HbA1c, glycated hemoglobin A1c. All continuous variables were normally distributed (as tested by the Shapiro-Wilk test, $p > 0.05$), and the t-test was used for comparison between groups; * indicates $p < 0.05$ compared with the baseline; # indicates $p < 0.05$ compared with the 3 months.

2.6 Evaluation of Self-Management Behavior

Self-management behavior of the patients was assessed using the Summary of Diabetes Self-Care Activities (SDSCA) scale [10]. This scale evaluates the self-management ability of diabetic patients across 6 dimensions, including general diet, specific diet, exercise, blood glucose monitoring, foot care, and medication compliance, consisting of a total of 11 items. In this study, the general diet and specific diet domains were integrated into a single dietary dimension (score range 0–28). Each item is scored on an 8-point scale ranging from 0 to 7, yielding a total possible score of 0 to 77. Higher scores indicate better self-management behaviors, and item 4 within the dietary dimension was scored in remission according to the scale guidelines.

2.7 Statistical Methods

Statistical analysis was conducted using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). The normality of continuous variables was assessed using the Shapiro-Wilk test. Measurement data that follow normal distribution were expressed as mean ± standard deviation (mean ± SD), and comparisons between groups were performed using the independent samples t-test. Non-normally distributed measurement data were expressed as median (interquartile range) and analyzed using the Mann-Whitney U test.

For within-group comparisons at different time points, the paired t-test or the Wilcoxon signed-rank test was used as appropriate. Count data were expressed as the number of cases (frequencies) and percentages and analyzed using the chi-square test. When expected cell frequencies in a 2×2 contingency table were less than 5, Yates' continuity correction was applied. The p-value of <0.05 was considered statistically significant.

3. Results

3.1 Comparison of Baseline Data Between the Two Groups

There were no statistically significant differences between the observation and control groups in terms of baseline characteristics, including age, gender, smoking status, alcohol consumption, place of residence, type of medical insurance, presence of complications, course of disease, blood glucose indicators, pancreatic islet function indices, BMI, and HbA1c ($p > 0.05$). The result indicates that the two groups were comparable at baseline. Fur-

Table 3. Comparison of target achievement rates of relevant metabolic indicators between the two groups.

Variable	Control group	Observation group	χ^2	*p*-value
Fasting blood glucose (mmol/L) (%)				
3	2 (3.333)	12 (20.339)	8.287	0.004
6	13 (21.667)	23 (38.983)	4.228	0.040
Postprandial blood glucose (mmol/L) (%)				
3	7 (11.667)	17 (28.814)	5.432	0.020
6	15 (25.000)	26 (44.068)	4.789	0.029
HbA1c (%)				
3	5 (8.333)	13 (22.034)	4.349	0.037
6	10 (16.667)	21 (35.593)	5.532	0.019
Remission rate (%)	4 (6.667)	12 (20.339)	4.778	0.029

Note: HbA1c, glycated hemoglobin A1c.

Table 4. Comparison of self-management behaviors between the two groups.

Variable	Control group	Observation group	Z	*p*-value
Exercise	12.000 (11.250, 12.000)	12.000 (11.000, 13.000)	–2.204	0.043
Diet	9.000 (8.000, 9.000)	11.000 (10.000, 13.000)	–7.138	<0.001
Foot care	8.000 (7.000, 8.000)	10.000 (8.250, 11.000)	–7.309	<0.001
Blood glucose monitoring	8.000 (8.000, 9.000)	9.500 (8.000, 11.000)	–4.058	<0.001
Medication	5.000 (5.000, 6.000)	7.000 (6.000, 7.000)	–7.965	<0.001
Total score	41.000 (40.000, 43.000)	50.000 (47.000, 52.000)	–8.890	<0.001

thermore, none of the enrolled patients achieved the target levels of fasting plasma glucose and 2-hour postprandial plasma glucose at baseline. This finding is consistent with the study design, which typically aimed to include patients with early-stage T2DM who still demonstrated poor glycemic control.

The control group included 60 patients with a mean age of 49.733 $\pm$ 10.111 years, comprising 35 males and 25 females. The observation group included 59 patients, with a mean age of 51.356 $\pm$ 11.690 years, comprising 41 males and 18 females. Baseline characteristics of the study participants are detailed in Table 1.

3.2 Comparison of Blood Glucose, Islet Function, and BMI Between the Two Groups

Changes in blood glucose, islet function, and BMI were compared between the two groups (Table 2). Patients in the observation group showed greater improvements in several key metabolic indicators at 3 and 6 months of intervention. Weight control was much better in the observation group than in the control group. At both 3 months and 6 months follow-up time points, BMI values were considerably lower in the observation group than in the control group ($p < 0.05$).

Similarly, fasting blood glucose and 2-hour postprandial glucose were significantly lower in the observation group at both follow-up time points (3- and 6-month) ($p < 0.05$). A similar pattern was found for HbA1c levels, with the observation group demonstrating significantly lower levels at both 3-month and 6-month follow-up time points ($p < 0.05$). However, indicators reflecting islet β-cell function, such as fasting and postprandial C-peptide levels, were substantially higher in the observation group than in the control group, indicating better recovery of islet function after treatment.

3.3 Comparison of Standard Achievement Rates of Relevant Metabolic Indicators Between the Two Groups

The number of patients achieving standard levels of critical blood glucose indicators was significantly higher in the observation group than in the control group (Table 3). After 3 months of treatment with continuing care services combined with the shared outpatient management model, the compliance rate of fasting blood glucose in the observation group reached 20.339%, which was significantly higher than 3.333% in the control group ($p = 0.004$). Similarly, the target level for 2-hour postprandial blood glucose was 28.814% in the observation group, compared with 11.667% in the control group ($p = 0.020$). The HbA1c target rate also differed considerably between the two groups, reaching 22.034% in the observation group versus 8.333% of the control group ($p = 0.037$).

After 6 months of follow-up, the differences between the two groups remained more evident. The standard rate of fasting blood glucose increased to 38.983% in the observation group, which was significantly higher than 21.667% in the control group ($p = 0.040$). The target postprandial blood glucose control rate was 44.068% in the observation group, compared with 25.000% in the control group ($p = 0.029$). Furthermore, the HbA1c target rate reached 35.593% of the observation group, which was significantly higher than 16.667% found in the control group ($p = 0.019$).

Moreover, 12 patients (20.339%) in the observation group reached the criteria for diabetes remission, a proportion significantly higher than the 4 patients (6.667%) in the control group ($p = 0.029$).

3.4 Evaluation of Self-Management Behaviors Between the Two Groups

As shown in Table 4, patients who received continuing care services combined with the shared outpatient management model had significantly better self-management performance than those who received conventional T2DM management care alone. The median total self-management score in the observation group was 50.00, which was substantially higher than 41.00 in the control group, and the difference between the two groups was statistically significant ($p < 0.001$).

Furthermore, analysis of the individual behavioral dimensions reinforced these results. Patients in the observation group demonstrated substantially higher median scores in dietary management, foot care, blood glucose testing, and medication compliance compared with those in the control group ($p < 0.001$). In terms of the exercise domain, the two groups had the same median score (12.00). However, the distribution of median scores showed slightly better performance in the observation group, and the difference between the two groups remained statistically significant ($p = 0.043$).

4. Discussion

Diabetes is a chronic metabolic disease and is primarily characterized by persistently increased blood glucose levels. More than 95% of cases are classified as T2DM. If not properly managed, this disease may result in severe complications, such as blindness, renal failure, myocardial infarction, stroke, and lower limb amputation [11,12]. The pathogenesis of T2DM is strongly associated with genetic predisposition and modifiable lifestyle indicators [13]. The findings of this study indicated that continuous nursing care combined with a shared outpatient management model may play a crucial role in improving relevant patient indicators and overall clinical outcomes in T2DM patients.

The present study shows that this continuing care service, combined with a shared outpatient management model, had favorable effects on several critical clinical indicators, including blood glucose levels, islet function, BMI, and HbA1c. Furthermore, patients receiving this integrated care demonstrated a higher rate of remission. Previous research has shown that impaired islet function in early-stage overweight or obese T2DM patients is often associated with insulin resistance and lipotoxicity [14]. Lifestyle interventions can significantly reduce pancreatic fat deposition and alleviate lipotoxic damage to β cells, thereby partially restoring insulin secretion and improving blood glucose control [6]. The results of the current study are consistent with this mechanism. Improvement in patients' diet, exercise, and medication adherence likely led to better metabolic control and enhanced islet function, ultimately increasing the rate of diabetes remission. The integrated model used in this study may have supported these metabolic improvements by systematically enhancing patients' adherence to recommended lifestyle and treatment behaviors through sustained nursing support and peer interaction.

The improvements in clinical indicators and metabolic outcomes found in this study were closely linked to enhanced patients' self-management. Successful diabetes control depends largely on the ability of the patient to maintain long-term behavioral alterations. Previous research has shown that structured interventions aimed at enhancing self-management ability can substantially improve blood glucose levels and maintain healthy behaviors over time [15]. In our study, ongoing nursing care provided continuous professional guidance and personalized education, helping patients reach better health information and translate that into practical daily life activities. Furthermore, the shared outpatient services developed a peer-support environment that encourages free discussion, experience sharing, and emotional support. This interactive and supportive environment may have increased patients' confidence and self-efficacy in managing their disease. Overall, these factors developed a supportive setting that reinforced positive behavioral changes in patients. In the present study, patients who received continuing care services combined with the shared outpatient management model had significantly higher scores across several domains of diabetes self-management, such as diet, exercise, foot care, blood glucose monitoring, and medication adherence. These observations are consistent with previous findings, which reported that telephone follow-up can improve psychosocial outcomes related to self-management in patients with diabetes [16]. Similarly, another study established a digital diabetes education and management platform using the WeChat application, where healthcare professionals provided disease-related education and explained self-management experiences. After 3 months of follow-up, patients demonstrated considerable improvement in both self-management skills and coping approaches [17].

The results of the present study suggest that continuing care service combined with the shared outpatient management model can effectively improve metabolic indicators, enhance islet function and self-management behaviors, and significantly increase the rate of diabetes remission. Furthermore, group-based interventions and remote follow-up approaches enable more efficient management without increasing clinical workload. More importantly, improvements in blood glucose control, islet function, and self-management ability may contribute to long-term disease control. Patients who achieve disease remission may be able to stop using antidiabetic drugs, which not only improves quality of life but also directly reduces

long-term treatment costs. Additionally, strengthening self-management behaviors, particularly regular blood glucose monitoring and medication compliance, may reduce acute medical complications and unplanned hospital visits associated with poor blood glucose control. Consequently, this model can improve overall healthcare resource utilization. Future studies can further quantify the model's specific benefits in reducing the direct medical- related costs (such as drug expenses, testing costs, and acute care utilization) through prospective cost-effectiveness analysis, to provide a more solid economic basis for its promotion in the broader health care system.

There are some limitations in this study. First, this is a retrospective observational study without random allocation of participants. Although the two groups were comparable at baseline, it is not possible to completely exclude the potential influence of unmeasured or undocumented confounding factors. Variables such as socioeconomic status, family support, initial motivation for behavioral change, and genetic background may have affected the observed outcomes. Second, this study was performed at a single center, whose management approach, execution of the medical team, and data recording standards may be center-specific, which limits the generalizability of the study results. Future studies should therefore include multicenter, prospective, randomized controlled trials to further investigate the efficacy of this integrated model. Such studies may also help identify subgroups of patients that are most likely to benefit from this structured intervention approach, thereby reinforcing more accurate and tailored approaches to T2DM management.

5. Conclusion

In conclusion, this retrospective cohort study indicates that a continuing care service combined with a shared outpatient management model can improve short-term metabolic control, enhance islet function, elevate the rate of disease remission, and support self-management behaviors in patients with T2DM. The findings further validate that this integrated care model provides an effective nursing strategy for long-term diabetes management and may offer a promising approach toward remission-oriented care.

Key Points

• This study evaluated an integrated care model combining continuous nursing with a shared outpatient management strategy for patients with early-stage T2DM.

• Patients in the observation group achieved significantly better glycemic control, enhanced islet function, and better metabolic outcomes at 3 and 6 months compared to conventional management.

• Self-management behaviors, especially in diet, medication adherence, and blood glucose monitoring, were substantially improved in the observation group.

• The diabetes remission rate was significantly higher among patients receiving the integrated intervention, indicating that this mode may represent a promising strategy for promoting T2DM remission and enhancing long-term disease care.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions

CRZ and XHC designed the research study. CRZ performed the research. CRZ and XHC analyzed the data. XHC drafted this article. Both authors contributed to the important editorial changes in the manuscript. Both authors read and approved the final manuscript. Both authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was approved by the Ethics Committee of Cangnan Hospital of Wenzhou Medical University (approval number: 2024019). The Ethics Committee waived the requirement for informed consent for this was a retrospective study using only de-identified data from routine clinical practice, the research posed minimal risk to patients. The waiver complied with the institutional policies and relevant national regulations for retrospective chart review studies. All procedures adhered to the principles of the Declaration of Helsinki.

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Conflict of Interest

The authors declare no conflict of interest.

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