BRITISH JOURNAL OF HOSPITAL MEDICINE

ARTICLE

Impact of Co-Management Mode on Diagnosis and Treatment Compliance in Community-Level Diabetic Patients with Retinopathy

Xia Zhang[1,*], Yanjuan Wu[1], Hong Shi[2], Hongying Wang[3], Xiaochun Lan[1], Yuezhong Ren[4], Yihan Tong[5]

[1]Department of Endocrinology, Lanxi People's Hospital, Lanxi, Zhejiang, China
[2]Department of Ophthalmology, Lanxi People's Hospital, Lanxi, Zhejiang, China
[3]Department of Internal Medicine, Lanjiang Branch, Lanxi People's Hospital, Lanxi, Zhejiang, China
[4]Department of Endocrinology, The Second Affiliated Hospital of Zhejiang University School of Medicine, Hangzhou, Zhejiang, China
[5]Department of Clinical Medicine, Wenzhou Medical University Renji College, Wenzhou, Zhejiang, China
*Correspondence: xiazhangyh2001@163.com (Xia Zhang)

Abstract

Aims/Background To implement a co-management mode among community-level diabetes patients and analyze its impact on diagnosis and treatment compliance and diabetic retinopathy of the patients.

Methods A total of 80 patients who underwent diabetic retinopathy examination in Lanxi People's Hospital from January 2021 to March 2022 were retrospectively selected as the study objects. The clinical data of the patients were analyzed, including 40 patients who adopted the conventional diabetes management mode from January 2021 to August 2021 as the control group. From September 2021 to March 2022, 40 patients in the county medical service community diabetes management team model were adopted as the management group. The two groups of patients were compared in terms of diabetic retinopathy indictors, biochemical examination indicators, self-management ability, and nursing management satisfaction.

Results Number of patients complying with treatment protocols in the management group was higher than that in the control group ($p < 0.05$). The blood spot area, macular thickness, hemangioma volume, and visual-field grayscale value in the management group at the last follow-up were all lower than those in the control group ($p < 0.05$). The levels of diastolic blood pressure (DBP), systolic blood pressure (SBP), fasting blood glucose (FBG), hemoglobin A1C (HbA1c), total cholesterol (TC), and triglyceride (TG) in the management group at the last follow-up were all lower than those in the control group ($p < 0.05$). The scores of disease cognition ability, self-management ability, and nursing management satisfaction in the management group were all higher than those in the control group ($p < 0.05$).

Conclusion By changing management concept and implementing the whole-process management and treatment mode for diabetic patients within the scope of the county medical service community, the diagnosis and treatment compliance of the patients can be improved, and the effective control of blood glucose, blood pressure, and blood lipid levels can be achieved, thereby improving the self-management ability and nursing management satisfaction of the patients and providing a new nursing mode for chronic disease management.

Key words: diabetes; diabetic retinopathy; co-management mode; diagnosis; treatment compliance; self-management

Submitted: 26 April 2024 Revised: 4 July 2024 Accepted: 9 July 2024

How to cite this article:
Zhang X, Wu Y, Shi H, Wang H, Lan X, Ren Y, Tong Y. Impact of Co-Management Mode on Diagnosis and Treatment Compliance in Community-Level Diabetic Patients with Retinopathy. Br J Hosp Med. 2024. https://doi.org/10.12968/hmed.2024.0216

Introduction

Diabetic patients are susceptible to rupture of new retinal vessels due to chronic high sugar levels, which allows blood to penetrate the retina, affecting the retina and inducing retinopathy (Li et al, 2021). Approximately 20%–40% of diabetic patients have different degrees of retinopathy, which not only diminishes vision, but is also one of the main causes of blindness in adults, which can affect quality of life (Grzybowski et al, 2020; Lin et al, 2021a). The moderate non-proliferative stage is considered to be a watershed in the progression of the disease, which can be treated conservatively in the early stage and followed carefully in the late stage to minimize visual impairment (Grzybowski et al, 2020). Although early diagnosis and timely treatment can significantly reduce the risk of blindness, most patients with diabetic retinopathy seek treatment only after experiencing severe visual impairment, thus missing the optimal treatment window. Meanwhile, an incomplete understanding of diabetic retinopathy; a lack of compliance with therapy; and a poor control of blood glucose, blood lipids, and blood pressure will lead to the delays diagnosis and treatment (Drinkwater et al, 2021a; Sevgi et al, 2021). To realize early detection and timely intervention of diabetic retinopathy and to reduce the disease burden of diabetic patients, the National Health Commission of the PRC requires community-level healthcare institutions to establish a comprehensive medical service team with clinicians, which creates a two-way referral and hierarchic healthcare system. In recent years, with the development of the county medical service community mode, the medical and health resources of the county, along with townships and villages, have been integrated to improve resource allocation and efficiency (Gong et al, 2022; Song et al, 2022). Based on this, we explore a new nursing mode for the management of diabetic retinopathy by implementing a diabetes management team composed of the county medical service community and analyzing its impact on the early diagnosis and treatment compliance of patients with diabetic retinopathy.

Methods

General Information

A total of 80 patients with diabetic retinopathy who were examined in Lanxi People's Hospital from January 2021 to March 2022 were retrospectively selected as the study objects. The propensity score method is applied. Through nearest neighbor matching within the 1:1 caliper range and using the propensity score to construct a counterfactual framework, the problems of sample selection bias and endogeneity are solved. The matching caliper value is set to 0.1.

The grouping situation of the two groups of patients is set as a dummy variable (Ni). T1 is defined as the management group and T0 as the control group. Yi (1) and Yi (0) respectively represent the potential outcomes of individuals receiving different management models. n1 and n0 respectively represent the sample sizes of the management group and the control group. Xi represents a series of matching variables that affect the clinical outcome of sample i. $Xi \in Rp$ represents a P-dimensional baseline covariate vector. A Logit model is constructed to estimate the propensity score. The probability of a sample receiving treatment obtained by

this model is the propensity score value, and the average treatment effect (ATT) of baseline data on clinical outcomes is estimated based on this:

$P(Xi)=P(Ni=1 \mid X=Xi)$

$ATT=E[Yi(1) \mid P(Xi),Ni=1] - E[Yi(0) \mid P(Xi), Ni=0]$

After PS adjustment, except for the different distributions of treatment factors and outcome variables, other covariates between individuals in different groups should be balanced and comparable.

The sample size calculation refers to the formula $n=n=2\times[(t\alpha,v+t\beta,v)/(\delta/\sigma)]2$. After calculation, 36 samples are needed for the control group and the management group. Considering 10–20% loss to follow-up and refusal to participate, a total of 80 research objects are finally included, which meets the requirements of the sample size. According to the random number table method, patients are divided into 40 cases in the control group and 40 cases in the management group. Inclusion criteria were as follows: (1) Meeting the diagnostic criteria (Flaxel et al, 2020) for diabetic retinopathy. (2) Age $\geq$18 years old. (3) Normal cognitive function, good language expression skills, and skilled use of smartphones to access related information in WeChat. (4) Stage of retinopathy (Wu et al, 2013): I–III; DME grade (Wilkinson et al, 2003): mild to moderate. Exclusion criteria were as follows: (1) Diabetic retinopathy combined with dysfunction of heart, lung, liver, kidney, or other important organs. (2) Diabetic retinopathy combined with any mental disorders. (3) Diabetic retinopathy combined with any malignant tumors. (4) Unsuccessful pupil dilation examination and fundus observation. (5) Diabetic retinopathy combined with other eye diseases such as glaucoma and cataract. Drop-out criteria were those who were lost during the study period for any reason. The research protocol was approved by the Medical Ethics Committee of Lanxi People's Hospital, Ethics Approval Number: 2020 (Thesis) No. 102, and followed the principles of the Declaration of Helsinki. All participants and their families were informed of the study and signed informed consent forms.

Methodology

The control group was treated with routine clinical interventions. After the patients were diagnosed with diabetic retinopathy, the clinicians decided on the treatment plan, and the nurses in charge of the group were responsible for the implementation of relevant nursing measures for the patients according to professional knowledge and patients' specific conditions, including psychological interventions, diabetes health education, guidance on blood glucose monitoring, prevention of diabetic complications, etc., which were carried out throughout the whole process of hospitalization, diagnosis and treatment. Upon discharge from the hospital, the patients and their families received routine discharge information and education, including diet, exercise, medication and other daily life guidance. After discharge from the hospital, the patients were required to undergo regular follow-up examinations in the outpatient department. In case of abnormal and serious fluctuations in blood glucose and blood pressure during the follow-up, the patients should be admitted to the hospital for examination and treatment in time.

The management group was the diabetes management team model of county medical service community, and it was created as follows: ① Establishment of a diabetes management team of county medical service community: The members included 2 endocrinologists, 1 ophthalmologist and 5 nurses from the general hospital of the medical service community, and 2 physicians and 5 nurses from the community health service center. Ten community health service institutions of the medical service community were connected, spanning the county. The doctors and nurses of the general hospital conducted unified training and assessment on the specialist knowledge of diabetes and diabetic retinopathy for the staff of the sub-hospitals. ② Establishment of patient management files: Once diagnosed with diabetic retinopathy, patients were registered and health management files were established. ③ Health education training: The diabetes management team of county medical service community organized and arranged various forms of diabetes education training, including: basic knowledge of diabetes and acute and chronic complications such as diabetic retinopathy, monitoring methods and precautions for blood glucose, blood pressure, blood lipids, diet therapy, exercise therapy, drug therapy, psychological adjustment, self-monitoring, and self-management. ④ Outpatient education: During patients' consultation or follow-up, individualized education was conducted by specialist nurses, a "WeChat group for the management of patients with diabetic retinopathy" was established, with knowledge of diabetes and diabetic retinopathy shared through the WeChat group once a week to promote self-learning among patients and their families. Patients could give feedback on their indicators, consult, or exchange information in the WeChat group. Members of the diabetes management team of county medical service community discussed and formulated individualized diets, exercise and drug treatment plans based on the conditions of the patients, defined the control goals of blood glucose, blood pressure, and blood lipids, and made timely adjustments according to changes in indicators of the patients. ⑤ Follow-up observation: The team of community physicians and nurses, as well as family contracted physicians, regularly followed up the patients, conducted follow-up visits on the patients with diabetic retinopathy in areas under their care, collected various observation indicators such as blood pressure and blood glucose and provided guidance, and gave timely feedback on the abnormalities found. ⑥ Screening management and follow-up intervention: Physicians of the diabetes management team of the county medical service community visit community hospitals at least once a week to guide on the formulation of treatment and management plans, share county medical resources through testing, imaging and other information platfoms, and carry out joint diagnosis and treatment for hard-to-treat patients. After the patients were enrolled, the changes in the conditions of the patients were dynamically monitored and assessed through the participation of the medical staff of the general hospital of the medical service community and the community health service institutions, and the patients and their families, and the treatment plan was timely adjusted.

All patients were followed up for at least 1 year.

Indicators

① Diagnosis and treatment compliance: The diagnosis and treatment compliance of the patients was assessed by the degree of coincidence between patient's behavior in receiving the relevant treatment and medical advice, with the degree of 80%–100% considered complete compliance, 50%–80% considered partial compliance, and <50% considered non-compliance.

② Diabetic retinopathy indictors: Optical coherence tomography was used to examine the diabetic retinopathy indictors of the patients before intervention and at the last follow-up, including changes in blood spot area, macular thickness, hemangioma volume, and visual-field grayscale value.

③ Biochemical examination: Blood pressure, along with blood glucose and blood lipids, were monitored before intervention and at the last follow-up. Before the measurement of blood pressure, the patients were required to sit still for 15 min. The measurement was repeated three times with an automatic electronic sphygmomanometer, the mean value was taken, and the diastolic blood pressure (DBP) and systolic blood pressure (SBP) were recorded. Fasting venous blood was collected from the patients, and the levels of fasting blood glucose, hemoglobin A1C (HbA1c), total cholesterol (TC), and triglyceride (TG) were determined using an automatic biochemistry analyzer.

④ Disease cognition and self-management ability: The self-management ability of the patients was assessed using a "self-management behavior scale for diabetic patients (Schmitt et al, 2013)", including six dimensions of diet management, exercise management, medication management, blood glucose monitoring, foot care, and blood glucose management, with a total of 26 entries. A 5-point Likert scale was used, scored on a scale of 1–5, with a total score of 26–130 and higher scores indicating better self-management ability of diabetic patients. At the same time, the cognitive status of patients with diabetic retinopathy was assessed by disease cognition questionnaire, which included 10 items including risk factors, prognosis, disease consequences, personal control, treatment control, disease consistency, disease duration, emotional response, concern and understanding. The score was 0~10 points, and the total score was 0~100 points. A higher score indicates a more comprehensive knowledge of the disease. Assessments were conducted once before intervention and once at the last follow-up.

⑤ Nursing management satisfaction: The nursing management satisfaction of the patients was assessed using a self-made "Questionnaire on Nursing Management Satisfaction of Diabetic Patients" at the last follow-up, with a total score of 0–100 and higher scores indicating a higher nursing management satisfaction. The Cronbach's α coefficient of the scale is 0.918, indicating good reliability and validity.

Statistical Analysis

Data processing was conducted using SPSS 25.0 statistical software (IBM Corp., Armonk, NY, USA). Counting data were expressed in (%), the χ^2 test was used for unordered dichotomous or multichotomous data, and the rank-sum test was used

Table 1. Comparison of general information between the control group and the management group.

Parameter	Control group (n = 40)	Management group (n = 40)	χ^2/t	p
Age ($\bar{x} \pm s$, year)	67.81 ± 9.33	65.42 ± 8.60	1.191	0.237
Sex [case (%)]			0.464	0.496
Male	22 (55.00)	25 (62.50)		
Female	18 (45.00)	15 (37.50)		
Course ($\bar{x} \pm s$, year)	9.42 ± 2.16	10.02 ± 2.67	1.105	0.273
BMI ($\bar{x} \pm s$, kg/m^2)	26.21 ± 3.52	25.88 ± 3.49	0.421	0.675
Complication [case (%)]				
Hyperlipemia	17 (42.50)	21 (52.50)	0.802	0.370
Hypertension	22 (55.00)	25 (60.00)	0.205	0.651
Education [case (%)]			0.258	0.879
Primary school	11 (27.50)	13 (32.50)		
Junior high school	21 (52.50)	20 (50.00)		
High school and above	8 (20.00)	7 (17.50)		
Marriage [case (%)]			0.287	0.592
Married	30 (75.00)	32 (80.00)		
Others	10 (25.00)	8 (20.00)		
Primary caregiver [case (%)]			0.226	0.893
Self	9 (22.50)	10 (25.00)		
Spouse	16 (40.00)	17 (42.50)		
Child (ren)	15 (37.50)	13 (32.50)		
Staging of retinopathy [case (%)]			0.393	0.822
Stage I	19 (47.50)	18 (45.00)		
Stage II	16 (40.00)	15 (37.50)		
Stage III	5 (12.50)	7 (17.50)		
DME grading [case (%)]			0.621	0.431
Mild	11 (27.50)	8 (20.00)		
Moderate	29 (72.50)	32 (80.00)		

Note: DME, diabetic macular edema; BMI, body mass index.

for ranked data, expressed as Z. Measurement data were expressed as ($\bar{x} \pm s$), and the t-test was used, with $p < 0.05$ indicating that the difference was statistically significant.

Results

Comparison of General Information between the Control Group and the Management Group

There were no dropouts or losses to follow-up in this study, and 80 patients were finally enrolled. There were no differences in the comparison of the general information between the two groups ($p > 0.05$), as shown in Table 1.

Table 2. Comparison of diagnosis and treatment compliance between the two groups of patients [case (%)].

Group	Number	Complete compliance	Partial compliance	Non-compliance	Total compliance
Control group	40	6 (15.00)	23 (57.50)	11 (27.50)	29 (72.50)
Management group	40	14 (35.00)	24 (60.00)	2 (5.00)	38 (95.00)
χ^2					7.440
p					0.006

Table 3. Comparison of diabetic retinopathy indictors between the two groups of patients.

Group	Number	Blood spot area ($\bar{x} \pm s$, mm^2)		Macular thickness ($\bar{x} \pm s$, μm)		Hemangioma volume ($\bar{x} \pm s$, μm^2)		Visual-field grayscale ($\bar{x} \pm s$, %)	
		Before intervention	Last follow-up	Before intervention	Last follow-up	Before intervention	Last follow-up	Before intervention	Last follow-up
Control group	40	2.84 ± 0.52	2.45 ± 0.35*	395.11 ± 12.74	352.15 ± 9.77*	18.02 ± 2.15	15.32 ± 2.08*	4.22 ± 0.37	3.22 ± 0.31*
Management group	40	2.91 ± 0.60	1.65 ± 0.42*	392.07 ± 13.26	309.42 ± 10.86*	18.49 ± 2.20	11.38 ± 1.83*	4.18 ± 0.40	2.31 ± 0.24*
t		0.558	9.255	1.046	18.500	0.966	8.995	0.464	14.680
p		0.579	0.000	0.299	0.000	0.337	0.000	0.644	0.000

Note: Compared with the group before intervention, *$p < 0.05$.

British Journal of Hospital Medicine | 2024 | https://doi.org/10.12968/hmed.2024.0216

Table 4. Comparison of biochemical examination indexes between the two groups of patients.

Group	Number	DBP ($\bar{x} \pm s$, mmHg)		SBP ($\bar{x} \pm s$, mmHg)		FBG ($\bar{x} \pm s$, mmol/L)	
		Before intervention	Last follow-up	Before intervention	Last follow-up	Before intervention	Last follow-up
Control group	40	84.76 ± 8.24	86.05 ± 9.71	135.46 ± 10.08	131.29 ± 9.85	9.26 ± 2.68	10.32 ± 2.52
Management group	40	85.12 ± 9.37	80.31 ± 7.83*	139.24 ± 11.19	123.72 ± 10.83*	9.34 ± 2.25	7.24 ± 1.38*
t		0.182	2.910	1.587	3.270	0.145	6.780
p		0.856	0.005	0.117	0.002	0.885	0.000
Group	Number	HbA1c ($\bar{x} \pm s$, %)		TC ($\bar{x} \pm s$, mmol/L)		TG ($\bar{x} \pm s$, mmol/L)	
		Before intervention	Last follow-up	Before intervention	Last follow-up	Before intervention	Last follow-up
Control group	40	9.04 ± 2.31	10.43 ± 1.38*	4.26 ± 0.98	4.02 ± 0.63	1.59 ± 0.21	1.45 ± 0.14*
Management group	40	9.16 ± 2.49	8.04 ± 0.91*	4.19 ± 0.72	3.55 ± 0.70*	1.55 ± 0.18	1.33 ± 0.11*
t		0.223	9.144	0.364	3.156	0.915	4.263
p		0.824	0.000	0.717	0.002	0.363	0.000

Note: Compared with the group before intervention, *$p < 0.05$. DBP, diastolic blood pressure; SBP, systolic blood pressure; FBG, fasting blood glucose; HbA1c, hemoglobin A1C; TC, total cholesterol; TG, triglyceride.

Table 5. Comparison of disease cognition ability, self-management ability and nursing management satisfaction between the two groups of patients ($\bar{x} \pm s$, score).

Group	Number	Disease cognition ability		Self-management ability		Nursing management satisfaction
		Before intervention	Last follow-up	Before intervention	Last follow-up	
Control group	40	30.18 ± 6.64	77.09 ± 11.31*	58.59 ± 8.03	83.16 ± 10.66*	73.59 ± 8.43
Management group	40	31.33 ± 6.26	60.38 ± 10.50*	80.15 ± 8.46	97.26 ± 9.53*	85.62 ± 9.01
t		0.797	6.848	11.690	6.237	6.166
p		0.428	0.000	0.000	0.000	0.000

Note: Compared with the group before intervention, *$p < 0.05$.

Comparison of Diagnosis and Treatment Compliance between the Two Groups of Patients

Number of patients complying with treatment protocols in the management group was higher than that in the control group ($p < 0.05$), as shown in Table 2.

Comparison of Diabetic Retinopathy Indictors between the Two Groups of Patients

There were no significant differences in the blood spot area, macular thickness, hemangioma volume, and visual-field grayscale value between the two groups of patients before intervention ($p > 0.05$). The blood spot area, macular thickness, hemangioma volume, and visual-field grayscale value in the management group at the last follow-up visit were lower than those in the control group ($p < 0.05$), as shown in Table 3.

Comparison of Biochemical Examination Indexes between the Two Groups of Patients

There were no significant differences in the levels of DBP, SBP, fasting blood glucose (FBG), HbA1c, TC, and TG between the two groups of patients before intervention ($p > 0.05$), and the levels of DBP, SBP, FBG, HbA1c, TC, and TG in the management group at the last follow-up were lower than those in the control group ($p < 0.05$), as shown in Table 4.

Comparison of Disease Cognition Ability, Self-Management Ability, and Nursing Management Satisfaction between the Two Groups of Patients

There were no significant differences in the scores of disease cognition ability and self-management ability between the two groups of patients before intervention ($p > 0.05$). The scores of disease cognition ability, self-management ability and nursing management satisfaction in the management group at the last follow-up were higher than those in the control group ($p < 0.05$), as shown in Table 5.

Discussion

Studies have shown that diabetic patients cannot control blood sugar levels, which is more likely to cause diabetic complications. This means that they should monitor their blood glucose levels periodically to avoid development of diabetic fundopathy and diabetic nephropathy (Drinkwater et al, 2021b). After screening patients with mild to moderate diabetic retinopathy in the early stage, we applied different follow-up and management measures. The community diabetes management team model of county-level medical service can promote community diabetes patients to comply with the treatment plan. Due to the patient's lack of understanding of diabetic retinopathy, there is a lack of corresponding management and guidance after discharge, which is manifested as poor control of blood sugar, blood lipids and blood pressure (Pandit et al, 2023). The county's diabetes management team used WeChat to integrate patient management and follow-up, thus enhancing patient care after discharge from hospitals. Liu et al (2022) believe that continuous nursing can ensure that patients receive necessary health guidance after discharge and steadily improve their condition.

It has been reported that early diagnosis and treatment compliance of diabetic patients are of great significance in controlling disease progression. The higher the compliance of diabetic patients, the better the control of blood glucose level, more conducive to the implementation of long-term treatment measures, control of risk factors (Qi and Dong, 2022). In this study, it was found that the management group had the blood spot area, macular thickness, hemangioma volume and visual field gray value in the management group were lower than those in the control group at the last follow-up. And better control of the levels of DBP, SBP, FBG, HbA1c, TC, and TG than the control group at the last follow-up, indicating that the county's diabetes management has a positive effect on controlling disease progression. Poor control of the level of blood glucose, blood pressure, and blood lipids is an important factor that leads to visual impairment and retinopathy progression of patients with diabetic retinopathy. Compared with the traditional management, the diabetes management team of the county medical service community pays more attention to follow-up of the patients after discharge from the hospital. Nurses encourage patients and their families to educate themselves through online management, and ask patients to give timely feedback on relevant indicators. In addition, the diabetes management team develops a personalized diet, exercise and medication plan based on the patient's situation (Amoaku et al, 2020; Lin et al, 2021b). Meanwhile, specialist treatment was adopted for patients with diabetic retinopathy to improve their visual impairment. Lamptey et al (2023) found that improving the prevention and treatment effect in community and tertiary hospitals could slow down the progression of retinopathy.

Meanwhile, it was found in this study that the scores of disease cognition ability, self-management ability, and nursing management satisfaction in the management group at the last follow-up were all higher than those in the control group. Ahmad and Joshi (2023) found that the management mode of county medical community played a positive role in enhancing the self-management ability of rural diabetic patients. By providing comprehensive diabetic retinopathy counseling, thereby helping patients acquire good self-management skills (Lee et al, 2022). Wang et al (2023) found that high-quality nursing intervention could improve the disease cognition and self-management of patients with diabetic retinopathy. Strengthen the unified management of specialized hospitals and community hospitals and the relevant management and guidance of patients after discharge. Thereby improving disease cognition and self-management ability (O'Flynn, 2022). At the same time, in the study of Wu et al (2023), the co-management model of patients and medical team can improve nursing satisfaction. In this study, it was found that the diabetes management team of county-level medical service community had a good impact on the grass-roots diabetes patients.

Conclusion

In conclusion, implementing better management and treatment for diabetic patients within the scope of the county medical service community can improve diagnosis and treatment compliance of the patients. The effective control of blood

glucose, blood pressure, and blood lipid levels can improve self-management and nursing management satisfaction of the patients. The shortcomings of this study are the small sample size and the short observation period of the patients, which does not allow for a specific analysis of the long-term impact of disease progression in diabetic retinopathy. In addition, this study is of a single-blind design, and there is inevitably subjective bias caused by medical staff due to their need to take different intervention measures. Therefore, subsequent longitudinal studies with large samples and multiple centers as well as long-term follow-up observation of the disease progression are needed to further validate the findings of this study.

Key Points

- In this study, a randomized controlled, single-blind, prospective experiment is used to explore the impact of the diabetes management team mode of the county medical service community on the treatment compliance and diabetic retinopathy of diabetic patients.
- The goals were to establish a diabetes management team of the county medical service community, explore the use of information tools in implementing homogenized management and seamless connection under the mode of the general hospital-community hospitals-patient and families within the scope of the county medical service community, strengthen the follow-up management of patients after discharge and community screening, and detect retinopathy in diabetic patients as early as possible.
- There is a lack of health education on retinopathy in diabetes patients in community-level or community hospitals, and the rate of triple control of blood glucose, blood pressure, and blood lipids is low.
- Focus on and solve the problems of screening and whole-process management of the patients with diabetic retinopathy in community-level hospitals, explore the informatization and homogenization of whole-process management of the patients with diabetic retinopathy within the scope of the county medical service community, with good reproducibility, and obtain a mature management mode that can be promoted and applied in multiple county medical service communities.

Availability of Data and Materials

All data included in this study are available upon request by contact with the corresponding author.

Author Contributions

XZ was responsible for the conception, data summarization, and writing of the paper; YJW and YHT were responsible for the collection and organization of the data; YZR was responsible for the design of the paper and guidance of the feasibility analysis; HYW and HS were responsible for the collection and statistical analysis of

the data; XCL was responsible for the analysis of the results of the paper's data and its interpretation, and for drawing the graphs and charts; YZR was responsible for the overall quality control and review of the article as well as supervision and management. All authors contributed to important editorial changes in the manuscript. All authors read and approved the final manuscript. All 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 research protocol was approved by the Medical Ethics Committee of Lanxi People's Hospital, Ethics Approval Number: 2020 (Thesis) No. 102. All patients and their families were aware of this study and signed informed consent.

Acknowledgement

Not applicable.

Funding

This study is supported by Zhejiang Health science and technology plan (2023-XY062).

Conflict of Interest

The authors declare no conflict of interest.

References

Ahmad F, Joshi SH. Self-Care Practices and Their Role in the Control of Diabetes: A Narrative Review. Cureus. 2023; 15: e41409. https://doi.org/10.7759/cureus.41409

Amoaku WM, Ghanchi F, Bailey C, Banerjee S, Banerjee S, Downey L, et al. Diabetic retinopathy and diabetic macular oedema pathways and management: UK Consensus Working Group. Eye. 2020; 34: 1–51. https://doi.org/10.1038/s41433-020-0961-6

Drinkwater JJ, Chen FK, Davis WA, Davis TME. Knowledge of ocular complications of diabetes in community-based people with type 2 diabetes: The Fremantle Diabetes Study II. Primary Care Diabetes. 2021a; 15: 554–560. https://doi.org/10.1016/j.pcd.2021.01.008

Drinkwater JJ, Peters K, Davis WA, Turner AW, Bringans SD, Lipscombe RJ, et al. Assessment of biomarkers associated with rapid renal decline in the detection of retinopathy and its progression in type 2 diabetes: The Fremantle Diabetes Study Phase II. Journal of Diabetes and its Complications. 2021b; 35: 107853. https://doi.org/10.1016/j.jdiacomp.2021.107853

Flaxel CJ, Adelman RA, Bailey ST, Fawzi A, Lim JI, Vemulakonda GA, et al. Diabetic Retinopathy Preferred Practice Pattern®. Ophthalmology. 2020; 127: P66–P145. https://doi.org/10.1016/j.ophtha.2019.09.025

Gong Y, Zhou J, Ding F. Investigating the demands for mobile internet-based home nursing services for the elderly. Journal of Investigative Medicine. 2022; 70: 844–852. https://doi.org/10.1136/jim-2021-002118

Grzybowski A, Brona P, Lim G, Ruamviboonsuk P, Tan GSW, Abramoff M, et al. Artificial intelligence for diabetic retinopathy screening: a review. Eye. 2020; 34: 451–460. https://doi.org/10.1038/s41433-019-0566-0

Lamptey R, Amoakoh-Coleman M, Djobalar B, Grobbee DE, Adjei GO, Klipstein-Grobusch K. Diabetes self-management education interventions and self-management in low-resource settings; a mixed methods study. PLoS ONE. 2023; 18: e0286974. https://doi.org/10.1371/journal.pone.0286974

Lee AYL, Wong AKC, Hung TTM, Yan J, Yang S. Nurse-led Telehealth Intervention for Rehabilitation (Telerehabilitation) Among Community-Dwelling Patients With Chronic Diseases: Systematic Review and Meta-analysis. Journal of Medical Internet Research. 2022; 24: e40364. https://doi.org/10.2196/40364

Li Y, Mitchell W, Elze T, Zebardast N. Association Between Diabetes, Diabetic Retinopathy, and Glaucoma. Current Diabetes Reports. 2021; 21: 38. https://doi.org/10.1007/s11892-021-01404-5

Lin KY, Hsih WH, Lin YB, Wen CY, Chang TJ. Update in the epidemiology, risk factors, screening, and treatment of diabetic retinopathy. Journal of Diabetes Investigation. 2021a; 12: 1322–1325. https://doi.org/10.1111/jdi.13480

Lin T, Gubitosi-Klug RA, Channa R, Wolf RM. Pediatric Diabetic Retinopathy: Updates in Prevalence, Risk Factors, Screening, and Management. Current Diabetes Reports. 2021b; 21: 56. https://doi.org/10.1007/s11892-021-01436-x

Liu J, Shi X, Guo B. Influence of Information-Based Continuous Care on Disease Control and Treatment Compliance of Elderly Diabetic Patients. Evidence-based Complementary and Alternative Medicine. 2022; 2022: 4023123. https://doi.org/10.1155/2022/4023123

O'Flynn S. Nurses' role in diabetes management and prevention in community care. British Journal of Community Nursing. 2022; 27: 374–376. https://doi.org/10.12968/bjcn.2022.27.8.374

Pandit S, Ho AC, Yonekawa Y. Recent advances in the management of proliferative diabetic retinopathy. Current Opinion in Ophthalmology. 2023; 34: 232–236. https://doi.org/10.1097/ICU.0000000000000946

Qi S, Dong Y. Effect of Multidisciplinary Team Continuous Nursing on Glucose and Lipid Metabolism, Pregnancy Outcome, and Neonatal Immune Function in Gestational Diabetes Mellitus. Disease Markers. 2022; 2022: 7285639. https://doi.org/10.1155/2022/7285639

Schmitt A, Gahr A, Hermanns N, Kulzer B, Huber J, Haak T. The Diabetes Self-Management Questionnaire (DSMQ): development and evaluation of an instrument to assess diabetes self-care activities associated with glycaemic control. Health and Quality of Life Outcomes. 2013; 11: 138. https://doi.org/10.1186/1477-7525-11-138

Sevgi DD, Srivastava SK, Whitney J, O'Connell M, Kar SS, Hu M, et al. Characterization of Ultra-Widefield Angiographic Vascular Features in Diabetic Retinopathy with Automated Severity Classification. Ophthalmology Science. 2021; 1: 100049. https://doi.org/10.1016/j.xops.2021.100049

Song A, Lusk JB, Roh KM, Jackson KJ, Scherr KA, McNabb RP, et al. Practice Patterns of Fundoscopic Examination for Diabetic Retinopathy Screening in Primary Care. JAMA Network Open. 2022; 5: e2218753. https://doi.org/10.1001/jamanetworkopen.2022.18753

Wang YX, Liang JX, Lin R, Yan YJ, Li H, Chen MF. Stratified support pattern-based internet-assisted self-management therapy for diabetes mellitus -mild cognitive impairment: a randomized controlled trial protocol. BMC Endocrine Disorders. 2023; 23: 240. https://doi.org/10.1186/s12902-023-01485-1

Wilkinson CP, Ferris FL, 3rd, Klein RE, Lee PP, Agardh CD, Davis M, et al. Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. Ophthalmology. 2003; 110: 1677–1682. https://doi.org/10.1016/S0161-6420(03)00475-5

Wu L, Fernandez-Loaiza P, Sauma J, Hernandez-Bogantes E, Masis M. Classification of diabetic retinopathy and diabetic macular edema. World Journal of Diabetes. 2013; 4: 290–294. https://doi.org/10.4239/wjd.v4.i6.290

Wu Y, Min H, Li M, Shi Y, Ma A, Han Y, et al. Effect of Artificial Intelligence-based Health Education Accurately Linking System (AI-HEALS) for Type 2 diabetes self-management: protocol for a mixed-methods study. BMC Public Health. 2023; 23: 1325. https://doi.org/10.1186/s12889-023-16066-z