

Evaluation of the Effectiveness of Community Pharmacy Services on Rational Medication Use in Elderly Patients with Hypertension and Diabetes

Tian Zheng¹, Xulin Huang², Lei Liu^{2*}

¹The Eighth Affiliated Hospital of Xinjiang Medical University, Urumqi 830017, Xinjiang Uyghur Autonomous Region, China

²Department of Pharmacy, The Eighth Affiliated Hospital of Xinjiang Medical University, Urumqi 830017, Xinjiang Uyghur Autonomous Region, China

*Corresponding author: Lei Liu, 18119189513@163.com

Copyright: © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* To explore the effect of community pharmacy services on rational medication use in elderly patients with hypertension and diabetes. *Methods:* Between November 2022 and December 2023, 80 elderly patients with hypertension and diabetes were selected and randomly divided into a control group (routine medication guidance) and an observation group (community pharmacy services), with 40 subjects each. The medication effect scores, blood pressure, blood sugar levels, and quality of life scores before and after intervention were compared between the two groups. *Results:* Comparison of pharmaceutical knowledge, medication compliance, and safe medication behavior scores showed that the observation group had higher scores as compared to the control group ($P < 0.05$); blood pressure (systolic blood pressure, diastolic blood pressure, heart rate) and blood sugar (fasting blood glucose, 2 h postprandial blood glucose, glycated hemoglobin) index levels were compared, and the observation group's index levels were lower than those of the control group ($P < 0.05$); the scores of physical health, mental health, social relationships, and environment in the observation group were higher than those in the control group ($P < 0.05$). *Conclusion:* Community pharmacy services improved the rational medication effect of elderly patients with hypertension and diabetes, and improved their blood pressure, blood sugar control levels, and quality of life.

Keywords: Community pharmacy services; Elderly hypertension complicated with diabetes; Rational medication use

Online publication: March 24, 2024

1. Introduction

Hypertension combined with diabetes in the elderly refers to a common disease in which hypertension and diabetes coexist. With the intensification of population aging, the prevalence of hypertension and diabetes in the elderly is increasing yearly^[1,2]. This disease poses a serious threat to the patient's health. It can easily lead to complications such as cardiovascular and cerebrovascular diseases, and kidney damage, which seriously affects the patient's quality of life. Community pharmacy management refers to patient drug treatment management at the community level. It

includes a comprehensive assessment of patients, formulates individualized drug treatment plans, and guides patients to follow medical instructions. It also guides patients on safe and standardized drug use, thereby improving treatment outcomes and ensuring patient safety^[3-5]. Accordingly, this study selected 80 elderly patients with hypertension and diabetes to explore the practical application effect of community pharmacy services.

2. Materials and methods

2.1. General information

Between November 2022 and December 2023, 80 elderly patients with hypertension and diabetes were selected and randomly divided into groups. The observation group included 20 male and 20 female patients aged 65–75 years old, with an average of 70.28 ± 3.78 years. The control group included 22 male and 18 female patients aged 67–74, with an average age of 71.05 ± 3.66 years. The comparison of data between the two groups was not statistically different ($P > 0.05$).

Inclusion criteria: (1) Patients who meet the diagnostic criteria for hypertension and diabetes (Diagnostic criteria for hypertension: systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg measured on three different days; Diagnostic criteria for diabetes: symptoms such as polyuria, polydipsia, and unprovoked weight loss and random blood sugar ≥ 11.1 mmol/L, fasting blood sugar ≥ 7 mmol/L, 2 h postprandial blood sugar ≥ 11.1 mmol/L); (2) patients aged 60–75 years old; (3) patients with residential urban medical insurance; (4) patients who consented. Exclusion criteria: (1) Patients with renal hypertension and abnormal blood pressure caused by other reasons and type I diabetes; (2) patients with mental disorders; (3) patients with other severe and terminal diseases.

2.2. Methods

The control group received routine medication guidance where the administration methods and contraindications of various antihypertensive drugs were explained in detail, and patients were repeatedly instructed to follow the doctor's instructions.

The observation group received community pharmacy services covering several aspects: (1) Drug management and monitoring were conducted regularly through drug surveys and records, including drug type, dosage, usage, frequency, and other information. The patient's blood pressure, blood sugar, and lipid indicators were closely monitored, and the patient's medication effect and safety were evaluated accordingly to provide suggestions and adjustment plans. During the monitoring process, patients were monitored for signs of unwanted drug reactions, and timely measures were taken when needed. (2) Individualized treatment plans were formulated based on the patient's condition, age, gender, comorbidities and other factors. Based on the specific characteristics and needs of patients, drug side effects, interactions, drug selection, dose adjustment, medication time, and other factors were taken into consideration to ensure the safety and effectiveness of the treatment plan. (3) Patients were provided with relevant knowledge about hypertension and diabetes, including the causes, symptoms, complications, etc., to help patients understand their diseases. Furthermore, patients were educated on the correct use of medications, including medication time, dosage, and method of administration. They were also reminded to follow medical instructions and any queries were answered promptly. Emphasis was placed on regular follow-up visits and examinations for patients so that the treatment plans can be adjusted accordingly and disease progression can be monitored. At the same time, patients were encouraged to perform self-monitoring, such as blood pressure measurement, blood sugar monitoring, etc., to help them better manage the disease. (4) Patients were encouraged to adopt healthy lifestyles, such as a reasonable diet, moderate exercise, smoking cessation, alcohol restriction, etc., to improve disease management effects. Nutritional advice and recipes were provided to assist patients in developing a diet plan that suits their needs for weight and blood

sugar control. In addition, psychological support and guidance were provided to help patients actively cope with the pressure and distress caused by the disease.

2.3. Observation indicators

The medication effect score before and after the intervention was measured using a self-made form to measure the patients' pharmaceutical knowledge, medication compliance, and safe medication behavior. The full score for each item was 100 points, and the score was directly proportional to the medication effect. Blood pressure (systolic blood pressure, diastolic blood pressure, heart rate) and blood sugar (fasting blood sugar, 2 h postprandial blood sugar, glycosylated hemoglobin) indicator levels were measured before and after the intervention. If each indicator decreases, the blood pressure and blood sugar indicators improve; The quality-of-life score before and after intervention was measured using the World Health Organization Quality-of-Life Scale (WHOQOL-BREF) scale has four dimensions: physical health, mental health, social relationships, and environment. The total score of the first three dimensions is 4 to 20 points, and the total score of the last dimension is 8 to 40 points. A higher score indicates a higher quality of life.

2.4. Statistical methods

Statistical analysis was carried out using the SPSS 25.0 software. Count data were expressed as [*n* (%)] and compared using the chi-squared (χ^2) test; measurement data were expressed as mean \pm standard deviation and analyzed using the *t*-test. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Medication effect score before and after the intervention

As shown in **Table 1**, after the intervention, the scores of pharmaceutical knowledge, medication compliance, and safe medication practices of the observation group were higher than those of the control group ($P < 0.05$).

Table 1. Medication effect scores before and after the intervention (mean \pm standard deviation, points)

Group	Cases, <i>n</i>	Pharmaceutical knowledge		Medication adherence		Safe medication practices	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation group	40	45.23 \pm 5.46	69.55 \pm 6.43	55.82 \pm 5.43	75.21 \pm 4.70	51.27 \pm 4.18	72.37 \pm 5.26
Control group	40	45.80 \pm 5.69	53.17 \pm 6.83	55.38 \pm 5.21	63.38 \pm 6.85	51.13 \pm 4.18	61.58 \pm 3.14
<i>t</i>	-	0.4571	11.0438	0.3698	9.0064	0.1498	11.1398
<i>P</i>	-	0.6489	0.0000	0.7125	0.0000	0.8813	0.0000

3.2. Blood pressure and blood sugar index levels before and after the intervention

As shown in **Table 2**, the blood pressure (systolic blood pressure, diastolic blood pressure, heart rate) and blood sugar (fasting blood sugar, 2 h postprandial blood sugar, glycosylated hemoglobin) index levels of the observation group were lower than that of the control group after the intervention ($P < 0.05$).

3.3. Quality of life scores before and after the intervention

As shown in **Table 3**, the scores of physical health, mental health, social relationships, and environment of the observation group were higher than those of the control group after the intervention ($P < 0.05$).

Table 2. Blood pressure and blood glucose index levels before and after the intervention (mean ± standard deviation)

Group	Cases, <i>n</i>	Systolic blood pressure (mmHg)		Diastolic blood pressure (mmHg)		Heart rate (beats/min)		Fasting blood glucose (mmol/L)		Blood glucose 2 hours after meal (mmol/L)		Glycated hemoglobin (%)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation group	40	155.85 ± 8.41	122.68 ± 10.46	102.78 ± 7.21	78.53 ± 7.69	116.12 ± 10.26	79.29 ± 7.11	8.91 ± 1.22	6.22 ± 0.70	12.58 ± 1.82	8.43 ± 0.35	8.40 ± 1.31	5.38 ± 0.39
Control group	40	157.71 ± 9.55	140.67 ± 8.51	104.12 ± 8.33	89.15 ± 6.68	117.16 ± 9.64	91.10 ± 5.28	8.45 ± 1.22	7.50 ± 0.53	12.68 ± 1.55	9.33 ± 0.38	8.34 ± 1.50	7.14 ± 0.69
<i>t</i>	-	0.9244	8.4377	0.7693	6.5939	0.4672	8.4341	1.6862	9.2202	0.2646	11.0179	0.1905	14.0441
<i>P</i>	-	0.3581	0.0000	0.4440	0.0000	0.6417	0.0000	0.0958	0.0000	0.7920	0.0000	0.8494	0.0000

Table 3. Quality of life scores before and after the intervention (mean ± standard deviation, points)

Group	Cases, <i>n</i>	Physical health		Mental health		Social relationship		Environment	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation group	40	8.37 ± 2.17	15.19 ± 2.70	8.58 ± 2.27	15.71 ± 2.53	8.46 ± 2.38	15.62 ± 2.84	14.63 ± 2.58	27.40 ± 3.20
Control group	40	8.28 ± 2.70	10.74 ± 2.99	8.49 ± 2.42	10.64 ± 2.52	8.52 ± 2.97	10.76 ± 2.21	14.20 ± 2.37	19.93 ± 3.35
<i>t</i>	-	0.1643	6.9860	0.1716	8.9797	0.0997	8.5415	0.7763	10.1979
<i>P</i>	-	0.8699	0.0000	0.8642	0.0000	0.9208	0.0000	0.4399	0.0000

4. Discussion

Hypertension combined with diabetes in the elderly is a common chronic disease with a complex pathogenesis. First, the elasticity of blood vessels decreases, and the endothelial function of blood vessels is damaged, resulting in increased vascular resistance and slowed blood flow, thus resulting in hypertension. At the same time, the elderly's pancreatic islet function decreases, insulin secretion decreases, and cells become resistant to insulin, leading to increased blood sugar and eventually diabetes. For elderly patients with comorbidities, disease control is more difficult. If the patient has poor medication compliance, it will directly affect the efficacy of the medication. Therefore, it is crucial to develop relevant community pharmacy services [6-8].

Community pharmacy services are based on the concept of drug management and monitoring, which can promptly detect whether patients are adhering to prescribed drugs, encourage patients to follow treatment plans, and improve medication compliance. Formulating individualized treatment plans and education guidance enables patients to understand the role and importance of the administered drugs, thus increasing their confidence in drug treatment and compliance. With the development of individualized treatment plans as the core, appropriate drug types and dosages can be administered according to the patient's physiological condition and drug response to improve the treatment effect. In addition, education can increase the patient's awareness and understanding of safe medication, reduce anxiety and fear, and improve standardization and medication use. At the same time, guidance on lifestyle management can also prompt patients to adjust their diet, carry out exercises, etc., to improve the outcomes of drug treatment [9,10].

Results of this study showed that the scores of pharmaceutical knowledge, medication compliance, and safe medication behavior of the observation group were higher than those of the control group after intervention ($P < 0.05$). This is because health education can significantly improve the patient's medication knowledge, thereby making them realize the importance and necessity of taking medications as prescribed by the doctor. The blood pressure (systolic blood pressure, diastolic blood pressure, diastolic blood pressure, etc.) (blood pressure, heart rate) and blood sugar (fasting blood sugar, 2h postprandial blood sugar, glycated hemoglobin) index levels in the observation group were lower than those in the control group after intervention ($P < 0.05$). This is because community pharmacy management implements standardized medication use. With increased monitoring and development of individualized treatment plans, the patient's blood pressure and blood sugar levels can be controlled with the intervention of suitable drug treatment plans. The scores of physical health, mental health, social relations, and environment of the observation group were higher than those of the control group after intervention ($P < 0.05$). With appropriate lifestyle interventions, bad habits can be corrected, thus improving the patient's quality of life.

5. Conclusion

Community pharmacy services for elderly patients with hypertension and diabetes improved their medication knowledge, compliance, and awareness of safe medication, and, on this basis, effectively improved their blood pressure and blood sugar levels, and their quality of life. The overall application effect was ideal and worthy of promotion and application in clinical practice.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Mei L, Zhou H, Mazang, et al., 2021, Analysis of the Intervention Effect of a Service Model Based on Drug Treatment Management for Elderly Patients with Hypertension in the Community. *Chinese Hospital Medication Evaluation and Analysis*, 21(1): 97–100.
- [2] Tang L, 2022, The Impact of Multidisciplinary Chronic Disease Management Involving Pharmacists on the Medication Behavior and Blood Sugar Levels of Community Patients with Type 2 Diabetes. *Drug Evaluation*, 19 (14): 883–886.
- [3] Qian Q, 2021, Analysis of the Clinical Effect of Community Medication Management in Elderly Patients with Hypertension. *Medical Frontiers*, 11(3): 192–193 + 196.
- [4] Wang A, 2018, Analysis of Medication Management Among Elderly Patients with Hypertension in the Community. *The World's Latest Medical Information Abstracts (Continuous Electronic Journal)*, 18(9): 161 + 164.
- [5] Sun J, Lu X, Liao X, et al., 2022, Use WeChat Public Platform Applet to Build “Internet+” Community Diabetes Drug Treatment Management Services. *Shanxi Medical Journal*, 51 (2): 217–220.
- [6] Ma Y, 2021, Evaluation of the Application Effect of Family Doctor Contract Services in Community Care Management of Elderly Patients with Hypertension. *Chinese Community Physicians*, 37(4): 174–175.
- [7] Zhou L, Tian Z, Jin L, 2022, Current Cognitive Status of Non-Dipper Hypertension Among Elderly Community-Based Hypertensive Patients and the Effect of Family Doctor Contract Management. *International Journal of Nursing*, 41(3): 573–576.
- [8] Song D, Zhu D, 2021, Evaluation of the Effectiveness of Home Pharmacy Services in Managing Hypertension and Diabetes. *Chinese Pharmaceutical Industry*, 2021, 30 (24): 29–32.
- [9] Luo X, Huang Y, Feng S, et al., 2019, Study on the Impact of Outpatient Special Disease Management on Statin Treatment and Effects in Patients with Type 2 Diabetes in Community Health Service Centers. *Chinese General Medicine*, 22(11): 1277–1282.
- [10] Shi Y, 2018, Analysis of the Current Status of Aspirin Use In Community Management of Patients with Hypertension and Diabetes. *Clinical Medical Research and Practice*, 2018, 3(4): 90–91.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.