

# Observation on the Effectiveness of Pharmaceutical Services in Preventing Adverse Drug Reactions

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**Abstract:** *Objective:* To observe the effectiveness of pharmaceutical services in preventing adverse drug reactions. *Methods:* 56 patients were selected for data research in our hospital from January to December 2024. They were divided into groups by lottery, with 28 patients in each group. The research group applied pharmaceutical services, and the control group applied routine pharmaceutical services. The data between the groups were compared. *Results:* Compared with the control group, the study group had significantly fewer adverse drug reactions, the pharmaceutical service score was significantly higher after the intervention, and the medication service satisfaction was significantly higher,  $P < 0.05$ ; compared with the pharmaceutical service scores of the two groups before the intervention,  $P > 0.05$ . *Conclusion:* Pharmaceutical services are effective in preventing adverse drug reactions.

**Keywords:** Pharmaceutical services; adverse drug reactions; prevention; effect

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## 1. Introduction

Commonly used methods in clinical treatment of diseases include drug therapy. Rational use of drugs can improve the quality of patient care, protect patient life safety, and improve patient prognosis. However, adverse drug reactions may occur during the process. This risk event is difficult to completely avoid. After such situations occur, the patient's condition worsens<sup>[1]</sup>, the hospitalization time is prolonged, the medical burden increases, and even doctor-patient disputes are induced, which restricts the safe clinical use of drugs for patients. In recent years, clinical drug types have been continuously enriched and multi-drug combination scenarios have gradually increased. Therefore, the number of adverse drug reactions has increased year by year. Clinical reports indicate that the number reaches 3% to 10% in inpatients and 1% to 3% in outpatients<sup>[2]</sup>. Therefore, clinical practice must conduct in-depth discussions on how to build an efficient adverse drug reaction prevention system. Clinical studies have concluded<sup>[3]</sup> that a routine medication service model is implemented for patients, with doctors leading the formulation of medication plans, and pharmacists responsible for preparing and distributing drugs. This fails to provide full professional intervention in patients' medication, so adverse drug reactions are prone to occur. Clinical research pharmaceutical services are a new service model that is patient-centered during the specific implementation process. Pharmacists are deeply involved in the entire process of patients' clinical medication, identifying and avoiding patient medication risks from the source. Some studies have proposed<sup>[4-5]</sup>, that pharmaceutical services play a positive role in reducing the risk of adverse drug reactions. Based on this, this article also studies this. This

article selected 56 patients to observe the effectiveness of pharmaceutical services in preventing adverse drug reactions.

## **2. Materials and methods**

### **2.1. General information**

In our hospital from January to December 2024, 56 patients were selected for data research and divided into groups by lottery, with 28 patients in each group. The study group included 16/12 men and women, aged 25-69 ( $35.28 \pm 3.65$ ) years old, and the control group included 17/11 men and women, aged 24-68 ( $35.21 \pm 3.64$ ) years old. Comparison of the two sets of data resulted in  $P > 0.05$ .

### **2.2. Method**

The control group uses routine medication services, with medications prescribed by doctors. Pharmacists are responsible for checking basic information such as drug names, specifications, dosages, and quantities, and eliminating obvious writing errors. They do not review drug compatibility and dosage rationality. When distributing drugs, they verbally inform them of usage and dosage, and do not explain adverse drug reactions or how to deal with missed doses. After the patients leave the hospital, no follow-up medication monitoring is performed, and no follow-up is conducted on the patient's medication status.

The research team applies pharmaceutical services. The specific methods are: (1) When pharmacists contact patients, they use consultation to understand their allergy history, physical condition and other information. Allergy history includes drug allergy, food allergy, and past adverse drug reaction history. Physical condition includes liver and kidney function indicators, basic diseases, and combined medication status, and determines the medication plan based on the patient's actual situation. At the same time, an individual medication risk scoring model is established for patients, focusing on high-risk groups such as the elderly and those with liver and kidney dysfunction and deepening research. A red warning mode is set for high-risk groups, and risk prevention and control plans such as dose adjustment and alternative drug selection are formulated in advance. (2) Improve patients' medication compliance, help patients master pharmacological knowledge, and provide medication guidance and health education for patients. After patients master knowledge about disease hazards, drug effects, etc., they can strictly follow doctor's instructions and correct medication misunderstandings. (3) Organize the patient's specific medication status at this stage, and create a detailed medical record as a reference for pharmaceutical services to facilitate the patient's future treatment. Formulate a medication plan, keep in close contact with the patient's condition, reflect targeted and individualized characteristics, and record the patient's ward rounds, rescue, medication guidance, etc. in the medical record. Regularly communicate with the attending doctor, focus on studying the patient's medication effects, and jointly adjust the medication plan based on changes in the patient's condition. (4) Follow the principle of rationality and use systematic means to construct medication files for patients. The pharmacist is responsible for signing and properly filing them for future reference. (5) During the pharmaceutical service period, pay more attention to patient medication guidance. Pharmacists must ensure a friendly attitude, patiently communicate with patients and their families, and answer questions in a careful and responsible manner, so that patients and their families can deepen their understanding of the use of drugs, master the principles of drug action, adverse drug reactions, and how to actively deal with them. (6) Carry out multi-dimensional health education for patients and achieve hierarchical education. Pharmacists can conduct "pictorial manuals + oral explanations + family members' collaborative memory" education based on the characteristics of poor memory of elderly patients. They can convey medication knowledge to young patients through short videos, online Q&A and other digital means, emphasize the correct medication method, avoid patients from adverse reactions due to incorrect medication, and instruct patients to continue taking medication to improve patients' medication compliance. (7) Strengthen the review work and carefully check the prescriptions issued by doctors. If there is an issue with inappropriate drug compatibility, the doctor must be contacted promptly to change the prescription to ensure patient medication safety. Use a special audit system to manage high-risk drugs. High-risk drugs involve antibiotics, anticoagulants, and cytotoxic drugs. Establish an audit ledger to record corresponding problems. The ledger needs to be clear about the name of the drug, patient information, problem type, and rectification time, and also record

the rectification status.(8) In order to carry out smooth follow-up for patients in the future, guide patients to leave their contact information before discharge, and follow up once a week. In this way, we can understand the patient's medication status, questions, etc., solve problems, and record matters.

### 2.3. Observation indicators

- (1) Compare the adverse drug reactions of the two groups.
- (2) Compare the pharmaceutical service scores of the two groups. It is measured using a scale, involving 4 items, ranging from 0 to 100. A high score indicates a high evaluation of medication guidance.
- (3) Compare the satisfaction with medication services between the two groups. Measured using a questionnaire, 0-100 points, very satisfied with 80 to 100 points, satisfied with 60 to 79 points, and dissatisfied with 60 points. Total satisfaction = 100% - dissatisfaction.

### 2.4. Statistics

Use SPSS 28.0 software, use (mean  $\pm$  standard deviation) to describe measurement data, t test; use rate (%) to describe count data, test,  $P < 0.05$ , statistically significant.

## 3. results

### 3.1. Incidence of adverse reactions in the two groups

Compared with the control group, adverse drug reactions occurred significantly less in the study group,  $P < 0.05$ . See Table 1.

**Table 1.** Comparison of adverse drug reactions between the two groups (%)

Group	Dizziness	Nausea and vomiting	Abdominal pain	Fever	total
Research group (n=28)	0	1(3.57)	0	0	1(3.57)
Control group (n=28)	2(7.14)	3(10.71)	1(3.57)	1(3.57)	7(25.00)
$\chi^2$ false					5.2500
$P$					$< 0.05$

### 3.2. Two groups of pharmaceutical services

Comparing the pharmaceutical service scores of the two groups before the intervention,  $P > 0.05$ ; after the intervention, the pharmaceutical service scores of the study group were significantly higher than those of the control group,  $P < 0.05$ . See Table 2.

**Table 2.** Comparison of pharmaceutical service scores between the two groups ( $\bar{x} \pm s$ )

Group	Medication guidance		Things to note		Answer questions		Follow-up service	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Research group (n=28)	51.62 $\pm$ 4.33	72.02 $\pm$ 6.22	54.33 $\pm$ 4.36	78.23 $\pm$ 6.75	53.99 $\pm$ 4.56	80.15 $\pm$ 6.72	54.81 $\pm$ 4.61	72.02 $\pm$ 6.02
Control group (n=28)	51.36 $\pm$ 4.23	66.32 $\pm$ 6.15	55.02 $\pm$ 4.34	68.41 $\pm$ 6.42	53.99 $\pm$ 4.55	64.48 $\pm$ 6.33	54.88 $\pm$ 4.61	68.32 $\pm$ 6.15
$t$	0.2273	3.4482	0.5935	5.5781	0.0000	8.9817	0.0568	2.2750

Group	Medication guidance		Things to note		Answer questions		Follow-up service	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
<i>P</i>	0.05	< 0.05	0.05	< 0.05	0.05	< 0.05	0.05	< 0.05

### 3.3. Satisfaction after intervention between the two groups

Compared with the control group, the study group was significantly more satisfied with medication services,  $P < 0.05$ . See Table 3.

**Table 3.** Comparison of medication service satisfaction between the two groups (%)

Group	Very satisfied	Satisfied	Not satisfied	Overall satisfaction
Research group (n=28)	20(71.43)	7(25.00)	1(3.57)	96.43
Control group (n=28)	10(35.71)	11(39.29)	7(25.00)	75.00
$\chi^2$ false				5.2500
<i>P</i>				< 0.05

## 4. Discussion

A common risk event during clinical medication is adverse drug reactions, which will affect the patient's treatment effect, aggravate the patient's condition burden, and even lead to conflicts between doctors and patients. Based on this, the clinic proposes to build a scientific prevention system for patients. Pharmaceutical services are a full-process intervention model<sup>[6]</sup>, that can effectively solve the problem of frequent adverse drug reactions. This article studies its pharmaceutical value and verifies its value.

The results of this study show that the incidence rate of adverse reactions in the study group was 3.57%, which was significantly lower than that in the control group ( $P < 0.05$ ). This is because the pharmaceutical service has built a full-chain risk prevention and control system of "pre-event assessment - ongoing management and control - post-event monitoring" for patients: pre-medication assessment, face-to-face questioning During diagnosis, key patient information is collected, and the establishment of an "individual medication risk score model" is used to mark high-risk groups such as the elderly, those with liver and kidney dysfunction, and those with more than three underlying diseases, and a red warning mode is used to formulate prevention and control plans in advance such as dose adjustment and alternative drug selection<sup>[7]</sup>. Control was carried out during the medication process, and the safety of patients' medication was ensured through a two-person prescription review system and a special review mechanism for high-risk drugs. During this period, pharmacists conducted checks on key categories such as antibiotics, anticoagulants, and cytotoxic drugs, covering incompatibility, dosage accuracy, etc., and organically combined them with individualized data such as patients' coagulation function indicators and drug sensitivity test results to optimize the patient's medication plan. In this study, 3 cases of nausea and vomiting adverse reactions occurred in the control group. The research team conducted pre-event assessments and in-process audits to effectively prevent the occurrence of this type of risk events. After medication, the patient is monitored intensively, and a personalized follow-up plan is used to track the medication status of the patient through multiple channels such as phone calls and WeChat. Pharmacists will provide timely medication discontinuation guidance to patients with early signs of adverse reactions such as mild dizziness and gastrointestinal discomfort, or adjust the patient's medication. This move can effectively prevent patients from aggravating adverse drug reactions<sup>[8]</sup>. For example, a patient in the research group suffered from gastric discomfort after taking aspirin after being discharged from the hospital. The pharmacist followed up and found out and instructed him to take it after meals. At the same time, he used a gastric mucosal protective agent in combination, and the patient quickly relieved his symptoms. In addition, pharmacists should regularly

communicate with the attending doctor about the patient's medication effects, and jointly adjust the plan based on changes in the patient's condition, so as to significantly reduce the patient's risk of adverse reactions caused by irrational medication use.

From the dimensional analysis of pharmaceutical service scores, after the intervention, the scores of the four dimensions of medication guidance, notices, questions and answers, and follow-up services in the study group were significantly higher than those in the control group ( $P < 0.05$ ). This result reflects that pharmaceutical services have application advantages in improving service quality and patients' medication cognition. Carry out traditional medication services for patients. Patients rely on doctors' brief explanations during ward rounds to obtain medication knowledge. Because doctors have heavy diagnosis and treatment tasks, they do not have the time and energy to provide "one-to-one" precise guidance to patients. Patients do not understand core knowledge such as drug action mechanisms and adverse reaction identification. In this study, a "multi-dimensional education system" was provided for patients in the research group to conduct health education based on the characteristics of patients of different ages. For example, pharmacists are giving During the guidance of antihypertensive medication to patients, not only can the patient be informed of the taking time and dosage of nifedipine, but animated demonstrations can also be used to help patients quickly and accurately identify normal drug reactions and abnormal risks. Specific operations also involve personalized follow-up and provide patients with out-of-hospital medication services. Pharmacists can regularly remind patients of medication times, fully understand the patient's physical condition, strengthen the patient's medication compliance, and answer the patient's questions.

The clinical research results of this article show that the total satisfaction with medication services in the research group is 96.43%, which is significantly higher than that in the control group,  $P < 0.05$ . The reasons are analyzed: (1) Stratified health education is carried out for patients, which is accurately matched with the needs of patients. The research group carried out the "picture and text manuals + oral explanations + family members' collaborative memory" "" model can effectively prevent elderly patients from irregular medication due to incomplete information reception, and is consistent with the information acquisition habits of young patients. This "on-demand education" can help all patients clearly grasp medication knowledge, and it is easier to obtain patient approval, so the proportion of "very satisfied" in the research group is significantly higher. (2) The implementation of proactive safety notifications and prescription review has effectively enhanced patients' trust in pharmacists. Pharmacists in the research group took the initiative to explain the principles of drug action, adverse reactions, treatment methods, etc. to patients and their families, strictly reviewed prescriptions, and pointed out and corrected inappropriate drug combinations for patients. Patients can truly feel that pharmacists attach great importance to medication safety and can effectively eliminate patients' medication anxiety. Therefore, the dissatisfaction rate in the research group is much lower than that in the control group. (3) Carry out out-of-hospital follow-up for patients, forming a closed loop of continuous care. The research team retains the patient's contact information before discharge, and conducts follow-up visits once a week, which can help patients promptly solve the problem of out-of-hospital medication, allowing patients to feel the care of "not leaving the hospital after discharge". The patients are very satisfied with this, so the satisfaction of patients in the study group with medication services has been further improved, and a large gap has opened up between the patients in the study group and the control group.

In summary, the effectiveness of pharmaceutical services in preventing adverse drug reactions is ideal. Adverse drug reactions are significantly less likely to occur. After intervention, the pharmaceutical service score is significantly higher, and the satisfaction with medication services is significantly higher. It is worthy of clinical use and promotion.

## Disclosure statement

The author declares no conflict of interest.

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