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Effect of optimizing the process of chemotherapy drug allocation in intravenous drug allocation center on improving the quality of nursing management

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Abstract: *To explore the effect of optimizing the chemotherapy drug allocation process in the intravenous drug allocation centre on improving the quality of nursing management in hospitals. **I**n order to improve the efficiency and quality of nursing care, the hospital optimized the chemotherapy drug allocation process and personnel in the hospital's intravenous drug allocation centre. After optimising the dispensing process, the time to review prescriptions and the time to schedule and dispense drugs in the IV drug dispensing centre was significantly shorter than before, P<0.05; after optimising the dispensing process, the incidence of unqualified prescriptions and dispensing errors in the hospital was significantly lower than before, P<0.05. The satisfaction of nursing staff was significantly higher than before, P<0.05. Optimizing the chemotherapy drug dispensing process in the intravenous drug dispensing centre can improve efficiency and quality of care and reduce the occurrence of errors, thus helping to reduce nurses' work pressure and improve nurses' satisfaction.*

Keywords: *Travenous drug dispensing centre; Chemotherapy drugs; Allocation; Optimization; Nursing management*

1. Introduction

In the late 1960s, intravenous drug dispensing centres began to emerge, providing quality services for the rational use of clinical drugs by dispensing various drugs in an operating environment designed according to international standards and drug characteristics by professionally trained and qualified personnel in accordance with strict operating procedures [1]. Chemotherapeutic drugs have certain toxic side effects and their improper use may endanger patients' lives. Therefore, it is important to achieve efficient and safe allocation of chemotherapy drugs [2]. Actively improving and optimizing the chemotherapy drug allocation in hospital intravenous drug dispensing centres can further guarantee the quality of chemotherapy drug allocation and ensure the safe use of drugs by patients, while also avoiding the various conflicts brought about by this, which is conducive to alleviating nurse-patient conflicts and reducing nurses' work pressure [3]. In order to further improve the quality of nursing management, the hospital has optimized the chemotherapy drug allocation process in the intravenous drug allocation centre since January 2016, and achieved significant results as follows.

2. Data and methods

2.1 General information

In order to improve the efficiency and quality of nursing care, the hospital has optimized the chemotherapy drug allocation process and personnel in the hospital's intravenous drug allocation centre since January 2016. 1000 prescriptions, medications and medical orders and 20 nurses were selected for investigation before and after optimization. The nurses were all female. Before optimisation: age 26-42 years old, average (36.8±2.2) years old; 1 college, 19 undergraduate; 2 supervising nurses, 4 nurse practitioners and 14 nurses. After optimisation: age 28-44 years old, average (37.2±2.1); 1 college, 19 bachelor's degree; 3 supervising nurses, 5 nurse practitioners and 12 nurses. P>0.05 was comparable when comparing the age and education and title composition of nurses before and after optimization.

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2.2 Methods

Double drug prescription audit: a combination of system audit and manual audit was used. Firstly, the audit software was used to audit the dosage and solvent, compounding and route of drugs prescribed by doctors to judge the safety and compatibility of the drugs after compounding, and then the pharmacist reviewed the drugs, and if there was impropriety, he/she needed to give timely feedback to the doctors.

Rationalise human resources: Develop a flexible and flexible working system, with a pre-calculation of the second day's workload before the end of each afternoon, and then rationalise the number of people working the following day according to the situation.

Simplify the medication dispensing process: analyse the process of collecting and scheduling medication and checking it, and compress and improve the process where there is duplication. Small shelves can be set up next to the dispensing nurses to hold medication and dispensing tools, and the dispensed medication can be sent directly to the pharmacist for checking. When arranging medication, the different medications can be separated and sorted to avoid the need for staff to go back and forth to find them.

Safety management: rationalise the order in which medicines are placed and keep similar medicines separate. The "recent first" and "first to remove first to use" warning signs are hung on the drug shelves, while chemotherapy drugs are stored and configured separately, and confusing drugs can be distinguished by signs such as "sound like". Confusing drugs can be distinguished by signs such as "sound like". Blue labels are used for configuration operations; red labels are used for labelling and scheduling and audit operations. Larger quantities of medication can be pre-labelled and the hospital's existing LAN system can be used to change prescriptions and occurrence information to facilitate verification and change of information.

2.3 Observed indicators

Compare the time to audit prescriptions and the time to schedule medication and configure medication before and after optimisation. Also record unqualified medical orders and errors, and investigate the satisfaction of medical and nursing staff, including chemotherapy medication configuration skills and service attitude and whether medication is configured in a timely manner, with a score of 100 out of 100, including satisfied: >80 points, average: 60~80 points and unsatisfied: <60 points.

2.4 Statistical methods

The data were processed by SPSS 20.0 software. T - Test was used for measurement data and $\chi 2$ test was used for counting data. $p<0.05$ was statistically significant.

3. Results

3.1 Comparison of prescription review time and scheduling time and drug allocation time in the intravenous drug dispensing centre before and after optimisation of the chemotherapy drug allocation process

After optimisation of the allocation process, the time to review prescriptions and the time to schedule and allocate drugs in the IV drug dispensing centre was significantly shorter than before the optimisation, $p<0.05$; see Table 1.

Table 1 Comparison of prescription review time, scheduling time and drug allocation time at the IV drug dispensing centre before and after optimisation of the chemotherapy drug allocation process

Times	n	Prescription review time (min)	Drug scheduling time (h)	Drug dispensing time (min)
Before optimization	1000	5.93±0.21	2.36±0.19	1.38±0.18
After optimisation	1000	3.51±0.14	1.71±0.12	1.02±0.09
t		303.211	91.467	56.568
P		0.000	0.000	0.000

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3.2 Comparison of the incidence of unqualified medical orders and dispensing errors in the intravenous drug dispensing centre before and after optimisation of the chemotherapy drug allocation process

After optimising the allocation process, the incidence of unqualified medical advice and dispensing errors in the hospital decreased significantly compared with that before optimisation, P<0.05; see Table 2.

Table 2 Comparison of the incidence of unqualified orders and dispensing errors in the Intravenous Drug Dispensing Centre before and after optimisation of the chemotherapy drug allocation process

Times	n	Unqualified orders	Dispensing errors
Before optimization	1000	8(0.8)	6(0.6)
After optimisation	1000	1(0.1)	0(0.0)
χ^2		5.469	6.018
P		0.019	0.014

3.3 Comparison of nursing staff satisfaction before and after optimisation of chemotherapy drug allocation process

Nursing staff satisfaction was significantly higher than before optimisation, P<0.05; see Table 3.

Table 3 Comparison of nursing staff satisfaction before and after optimisation of chemotherapy drug allocation process

Times	n	Satisfied	Fair	Unsatisfied	Satisfied(%)
Before optimization	20	9	7	4	80.0
After optimisation	20	16	4	0	100.0
χ^2					6.778
P					0.033

4. Discussions

The results of the current study showed that after optimisation of the chemotherapy drug allocation process, the chemotherapy drug prescription review time and the time to schedule and allocate drugs were significantly reduced, and the results of this study were similar to those reported in various current literature [14-5]. In this study, the existing process in the hospital was redefined and improved, and the quality control of nursing care was strengthened. The current problems in each step of the process were analysed and optimised, such as rationalisation of staffing, optimisation of prescription review and simplification of work procedures, so that the chemotherapy drug allocation process could be more rational and the efficiency of nursing care could be continuously improved. During the process of optimisation, "5S" management is implemented, so that all kinds of drugs in the dispensing centre are positioned and managed in a certain quantity, thus promoting good working habits among nursing staff, maintaining good hygiene in the dispensing centre, allowing nursing staff to identify the items they need more accurately, ultimately shortening working time, reducing nurses' work pressure and improving their satisfaction [6]. Improve their satisfaction [6].

The results of this study showed that after optimising the chemotherapy drug allocation process, the rate of unqualified orders and dispensing errors in the hospital decreased significantly, which is similar to the results reported in the domestic and international literature [7]. After optimising the chemotherapy drug dispensing process, the nursing staff's awareness of responsibility was improved by improving the drug placement and review methods and strengthening the drug dispensing audit to ensure the accuracy of each operation, thus avoiding the occurrence of drug dispensing errors, ensuring the safety of patients' drug administration and reducing the occurrence of nurse-patient conflicts. Most chemotherapeutic drugs are cytotoxic, which can kill tumour cells, but can also cause certain damage to normal human tissue cells, leading to various adverse reactions. This time, by simplifying work procedures and strengthening safety management to improve the accuracy of chemotherapy drug configuration, not only can guarantee the safety of patients' medication, but also continuously improve nurses' work efficiency, reduce their work intensity and improve their satisfaction [8]. Satisfaction is an

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important indicator for evaluating the quality of nursing services and the quality and quality of medical services, and the core of hospital services is "patient satisfaction and government reassurance", with everything being service-oriented. This time, through continuous optimisation of the chemotherapy drug allocation process, by rationalising human resources, improving work efficiency and allowing nurses to leave work on time, it is conducive to enhancing nurses' sense of self-worth and pride and improving their satisfaction.

In conclusion, optimising the chemotherapy drug allocation process in the IV drug dispensing centre can improve efficiency and reduce errors, ultimately achieving a win-win situation for both nurses and patients, as well as promoting nursing staff to change their working style and service concept, and continuously improving the quality of nursing care.

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