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Practical Analysis of the Matrix Medical Administration Model to Improve Medical Safety Level

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Abstract: *Objective*: To analyze the effectiveness of the matrix medical administration model in enhancing medical safety management. *Method*: A total of 39 medical incidents in the hospital from September 2020 to September 2022 were selected as the reference group, implementing conventional medical administration. Another 39 medical incidents from October 2022 to October 2024 were chosen as the experimental group, adopting the matrix medical administration model. The practical indicators such as causes of medical disputes, dispute compensation, medical injury appraisal results, and diagnosis and treatment quality indicators were compared between the two groups. *Results*: In the experimental group, the primary reasons for medical disputes were patient-related, and most disputes resulted in no compensation. After medical injury appraisal, most cases were not considered medical injuries. The comparison between the two groups was statistically significant ($P < 0.05$). The diagnosis and treatment quality indicators of the experimental group were superior to those of the reference group ($P < 0.05$). *Conclusion*: The matrix medical administration model can reduce medical disputes caused by hospital factors, decrease the proportion of compensation and the incidence of medical injuries, and improve the quality of diagnosis and treatment, demonstrating high management effectiveness.

Keywords: Matrix medical administration model; Medical safety; Causes of disputes; Quality of diagnosis and treatment; Effectiveness

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1. Introduction

Medical safety level directly impacts the effectiveness of hospital management. To enhance medical safety and reduce medical disputes and injuries, China has actively introduced various laws and regulations to ensure orderly and standardized medical administration [1]. However, these measures cannot eliminate medical disputes from their root causes, necessitating more reliable and efficient medical administration strategies. The matrix management model optimizes both flat and vertical management approaches, balancing management scope and hierarchy to

maximally meet the needs of medical safety management. This highly flexible management can reduce medical incidents through a rapid response mechanism and optimize work efficiency, exhibiting strong scientific and practical management characteristics [2]. Therefore, this study selected 78 medical incidents to evaluate the implementation effects of matrix medical administration.

2. Materials and methods

2.1. General information

The reference group comprised 39 medical incidents that occurred in the hospital from September 2020 to September 2022, involving 39 patients. Among them, there were 23 medical disputes and 16 medical injuries. The patients included 24 males and 15 females, aged between 40 and 82 years, with a mean age of 55.95 ± 4.18 years. The experimental group consisted of 39 medical incidents that occurred from October 2022 to October 2024, also involving 39 patients. There were 22 medical disputes and 17 medical injuries. The patients comprised 26 males and 13 females, aged between 38 and 84 years, with a mean age of 55.82 ± 4.27 years. There were no significant differences in basic information between the two groups ($P > 0.05$).

Inclusion criteria: Medical disputes or medical injuries occurring in the hospital; inpatients; patients aged over 18 years; complete basic information; normal communication ability; and high informed consent for the study. Exclusion criteria: Medical events occurring after discharge; patients in special periods such as pregnancy or lactation; patients with mental illnesses; and withdrawal from the study.

2.2. Methods

The reference group implemented conventional medical administration: a vertical management model was selected, which was divided into multiple departments, such as the pharmacy department, medical department, and equipment department, based on functions. Each department was responsible for internal management, that is, systematic self-management.

The experimental group implemented matrix medical administration: (1) Vertical management: Optimize the internal management processes of various departments such as the medical department or pharmacy department, summarize the management effectiveness of each department once a week, evaluate the feasibility of management measures based on feedback, improve management content in a targeted manner, and strengthen internal supervision. Regularly conduct spot checks on the management quality of departments such as the pharmacy department or nursing department, evaluate their management issues occasionally, provide knowledge training for medical staff in various departments, and carry out professional ethics training activities to enhance their sense of responsibility. Clarify the management norms of each department and require medical staff to engage in relevant work according to relevant systems and norms to prevent medical incidents. (2) Horizontal management: Members of the management team come from the superior departments of the vertical management system, with the team leader being the head of the superior department, responsible for coordinating and arranging management issues and coordinating the management work among different groups. Medical staff from the pharmacy department, medical department, and nursing department form a safety assurance team, responsible for dynamically evaluating the existing problems of medical safety management, continuously providing feedback, and improving the current management process. The medical department, the dean's office, and the pharmacy department form a drug supervision team, responsible for evaluating the management of drug procurement, distribution, adverse

reaction monitoring, and other aspects. Each team organizes a collective meeting once a week, based on the research direction and management objectives of each team, deeply analyzes the current management deficiencies, uses brainstorming to uncover the essence of the problems, and develops problem-solving strategies for each department. Daily management should strengthen communication frequency among departments, mutually monitor the implementation of their management, and report management defects as improvement targets for subsequent management.

2.3. Observation indicators

(1) Causes of medical disputes: (a) Patient factors: weak legal awareness, poor cognition of medical knowledge; (b) Hospital factors: limited doctor-patient communication skills, inadequate management and supervision, insufficient skills of medical staff. (2) Dispute compensation: whether there was compensation. (3) Medical malpractice appraisal results: whether it was a medical malpractice incident. (4) Quality indicators of diagnosis and treatment: patient mortality rate, disease cure rate, disease recurrence rate, complication rate, referral rate, follow-up rate outside the hospital, number of visits, waiting time for visits, nursing satisfaction (self-made scale, total 100 points, positive scoring).

2.4. Statistical analysis

The data processing software used was SPSS 28.0. Measurement data were represented as mean ± standard deviation (SD), and *t*-value comparison and test were implemented. Count data were represented as [*n* (%)], and chi-square value comparison and test were implemented. If the statistics were significant, then $P < 0.05$.

3. Results

3.1. Comparison of the causes of medical disputes between the two groups

Among the causes of medical disputes in the experimental group, the proportion of patient factors was lower than that in the reference group ($P < 0.05$). See **Table 1**.

Table 1. Comparison of the causes of medical disputes between the two groups [*n* (%)]

Group	*n*	Patient reasons			Hospital reasons			
		Weak legal awareness	Poor cognition of medical knowledge	Total	Limited doctor-patient communication skills	Inadequate management and supervision	Insufficient skills of medical staff	Total
Experimental group	23	3 (13.04)	3 (13.04)	26.09 (6/23)	8 (34.78)	5 (21.74)	4 (17.39)	73.91 (17/23)
Reference group	22	7 (31.82)	6 (27.27)	59.09 (13/22)	4 (18.18)	3 (13.64)	2 (9.09)	40.91 (9/22)
χ^2	-	2.293	1.423	5.021	1.585	0.505	0.670	5.021
P	-	0.130	0.233	0.025	0.208	0.477	0.413	0.025

3.2. Comparison of dispute compensation between the two groups

In the experimental group, the proportion of uncompensated events was higher than that in the reference group ($P < 0.05$). See **Table 2**.

Table 2. Comparison of dispute compensation between the two groups [*n* (%)]

Group	*n*	No compensation	Compensation
Experimental group	23	18 (78.26)	5 (21.74)
Reference group	22	10 (45.45)	12 (54.55)
χ^2	-	5.148	
P	-	0.023	

3.3. Comparison of medical malpractice appraisal results between the two groups

In the appraisal results of the experimental group, the proportion of events that were not considered medical malpractice was higher than that of the reference group ($P < 0.05$). See **Table 3**.

Table 3. Comparison of medical malpractice appraisal results between the two groups [*n* (%)]

Group	*n*	It is not a medical malpractice incident	It is a medical malpractice incident
Experimental group	16	14 (87.50)	2 (12.50)
Reference group	17	9 (52.94)	8 (47.06)
χ^2	-	4.661	
P	-	0.031	

3.4. Comparison of diagnosis and treatment quality indicators between the two groups

The diagnosis and treatment quality indicators of the experimental group were better than those of the reference group ($P < 0.05$). See **Table 4**.

Table 4. Comparison of diagnosis and treatment quality indicators between the two groups [*n* (%), mean ± SD]

Group	*n*	Patient mortality Rate	Disease cure rate	Disease recurrence rate	Complication rate	Referral rate	Follow-up rate outside hospital	Number of visits	Waiting time for visits (min)	Nursing satisfaction (score)
Experimental group	39	0	38 (97.44)	2 (5.13)	1 (2.56)	2 (5.13)	32 (82.05)	1.81 ± 0.42	15.85 ± 3.41	96.42 ± 2.85
Reference group	39	4 (10.26)	33 (84.62)	8 (20.51)	7 (17.95)	9 (23.08)	24 (61.54)	2.44 ± 0.59	25.43 ± 4.68	92.11 ± 2.73
χ^2	-	4.216	3.924	4.129	5.014	5.186	4.052	5.433	10.332	6.820
P	-	0.040	0.048	0.042	0.025	0.023	0.044	0.000	0.000	0.000

4. Discussion

Medical administration refers to the government management of medical safety, health care, and other related issues implemented by hospitals. Its service subjects are medical workers, medical institutions, etc., constituting a comprehensive and multi-dimensional management service [3]. The effectiveness of medical administration plays a decisive role in the level of medical safety and affects the rational allocation of medical resources and the health status of patients. Its management content is complex and has special characteristics, including safety guarantees, disease treatment, prevention of complications, and other aspects, which are prone to medical disputes or damage events. To reduce conflicts between doctors and patients during medical administration and create a

harmonious and safe medical environment, most hospitals systematically implement management content based on relevant documents such as the "Tort Liability Law" or "Medical Accident Classification Standards" during the management period. However, institutional constraints cannot solve deep-seated problems, so their role in improving medical safety levels is limited [4]. Based on this, hospitals actively seek standardized, improved, and efficient medical administration models, introducing matrix management.

Matrix management is a new management model derived from organizational structure forms. It has strong flexibility, can simplify administrative command chains, improve coordination among medical staff, and highly integrate existing resources, thereby improving management effectiveness [5]. This nursing extends management thinking to "surface" or "volume" management, preventing many problems that arise during conventional management such as "point" or "line" management. Specifically, matrix management can expand the management scope under the horizontal management model and enrich the management levels under the vertical management model, bringing the two into a dynamic balance [6]. Moreover, this management can rationalize the allocation of human resources and management projects, keeping the upper-level departments and various management teams in a state of power balance, thereby sharing medical information and coordinating medical resources.

The results showed that among the causes of medical disputes, the proportion of patient factors in the experimental group was 26.09%, and the proportion in the reference group was 59.09%. Evidently, the experimental group was lower than the reference group ($P < 0.05$). The reason is that matrix management focuses on aspects such as the frequency of doctor-patient communication and the professional skills of medical staff. It can clearly delineate management authority, avoid power overlaps, and thereby improve the overall level of hospital management. Horizontal management can establish rules for various departments, ensuring the orderly progress of vertical management. At the same time, it deeply analyzes the underlying causes of medical disputes, targets the improvement of the overall quality of medical staff, makes them focus on patients' thoughts, explains medical knowledge in detail, and evaluates the precipitating factors of medical disputes from multiple perspectives. Then, it reasonably improves management measures to reduce disputes caused by hospital factors [7]. In terms of dispute compensation, the proportion of uncompensated events in the experimental group was 78.26%, and the proportion in the reference group was 45.45%. Apparently, the experimental group was higher than the reference group ($P < 0.05$). The reason is that matrix management can achieve two-line management, simultaneously establishing two teams responsible for daily affairs management and drug management, respectively. The management team is responsible for supervising the implementation of management, which can significantly enhance the sense of responsibility of medical staff, ensure the efficient implementation of management projects, and thereby reduce compensation events [8]. Among the appraisal results of medical malpractice, the proportion of events not considered medical malpractice in the experimental group was 87.50%, and the proportion in the reference group was 52.94%. Evidently, the experimental group was higher than the reference group ($P < 0.05$). The diagnosis and treatment quality indicators of the experimental group were better than those of the reference group ($P < 0.05$). The reason is that matrix management can reduce communication costs among various departments, maximize the utilization of medical resources based on the principles of interaction, mutual assistance, and complementarity, strengthen the communication efficiency of medical staff regarding medical malpractice events, and develop feasible and comprehensive improvement plans to reduce medical malpractice events [9]. Additionally, this management has the advantages of being multi-dimensional and dynamic, enabling medical staff to quickly adapt to the management needs of medical safety and continuously improve their basic management skills and professional functions. Furthermore, during the management period, a horizontal system

can be utilized to carry out systematic management of specialized tasks, while integrating a vertical leadership system, enabling innovative multi-dimensional management, thereby significantly improving the quality of diagnosis and treatment [10].

5. Conclusion

In summary, matrix management can enhance the effectiveness of medical safety management, reduce medical disputes or damage events, lower the compensation ratio for medical disputes, and maximize the improvement of diagnosis and treatment quality. It has a promoting significance for raising the level of medical safety.

Disclosure statement

The author declares no conflict of interest.

References

[1] Dong C, Wang J, 2024, The Impact of Closely Integrated Medical Consortium Combined with Matrix Medical Administration Model on Hospital Quality and Safety. China Health Standard Management, 15(17): 35–38.

[2] Hu L, Huang J, Jiang R, et al., 2025, Research on Organizational Inertia and Preventive Strategies of Medical Quality and Safety Management. Chinese Hospital Management, 45(3): 55–59.

[3] Xin X, Peng X, Yang W, 2025, Establishing a Long-Term Medical Quality and Safety Management System based on the Performance Evaluation of Tertiary Public Hospitals. Modern Medicine & Health, 41(2): 560–563.

[4] Li N, Zhang H, Huang Y, 2024, Exploration of Party Branch Construction in Public Hospitals based on Matrix Management. Modern Hospital, 24(12): 1835–1838.

[5] Yue J, He S, Li L, et al., 2024, Practical Exploration of Carrying Out Disciplinary Inspection and Supervision Work in Public Hospitals based on the Matrix Management Model. Modern Hospital, 24(6): 851–853, 856.

[6] Wang Y, Bao S, Chen X, 2023, Exploration of Constructing an Internal Audit Model for Public Hospitals based on Matrix Management. Chinese Hospitals, 27(2): 10–12.

[7] Hu L, Zhang L, Li J, et al., 2020, Discussion on the Construction of Professional Ethics in Tertiary General Hospitals based on Matrix Management Mode. Chinese Journal of Hospital Administration, 36(11): 926–930.

[8] Lv F, Yang H, Gao Q, et al., 2020, Application of Matrix Management in the Management of Hospital Nurses with Master's Degree. Chinese Nursing Education, 17(4): 362–365.

[9] Wu L, Zhu C, 2024, Application of Matrix Management Mode in Hospital Nutrition Nursing Quality Management. General Nursing, 22(11): 2113–2116.

[10] Shi J, 2021, Discussion on the Construction of Hospital Professional Ethics under the Matrix Management Mode. China Health Industry, 18(17): 82–85.