Root Cause Analysis of Medical Malpractice in Primary-Level Hospitals and Recommendations for Improvement Measures Under Beijing Local Standards: Postprint

Authors: Zhao Tiefu, Xu Xuemin, Wang Na, Peng Jie, Tian Xuedi, Zhang Bo, Feng Yan, Ma Hanying, Liu Kai, Liu Huanhuan, Ma Hanying

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Abstract

Background: In the mediation and handling of physician-patient disputes involving primary-level hospitals, medical negligence in diagnosis and treatment behavior is identified in the majority of cases. Timely detection, reduction, or elimination of medical negligence constitutes an important responsibility of medical institutions and health administrative departments. Promoting improvement and enhancement of medical quality in primary-level hospitals is of particular significance. The promulgation of the Beijing municipal standard "Coding Specification for Critical Control Points of Medical Behavior" has enabled standardized analysis of root causes of medical negligence in primary-level hospitals.

Objective: To investigate the root causes of medical negligence in primary-level hospitals from the perspective of the Beijing municipal standard and to propose improvement measures for medical quality enhancement.

Methods: Judgments issued by Beijing municipal courts at all levels from 2019 to 2022 involving medical negligence in Beijing' s primary-level hospitals, with medical damage as the cause of action, were collected as research subjects. The Beijing municipal standard "Coding Specification for Critical Control Points of Medical Behavior" was applied as the basis for inductive analysis of root causes of medical negligence, and improvement measures for medical quality enhancement were proposed.

Results: From 2019 to 2022, 127 judgments/rulings by Beijing municipal courts at all levels involving primary-level hospitals, with medical damage as the cause of action, identified medical negligence in hospital diagnosis and treatment behavior. Among the various root causes, poor physician-patient communication

ranked first (32 cases, 25.2%), followed by inappropriate treatment protocols (31 cases, 24.4%), deficient medical record documentation (23 cases, 18.1%), and practice beyond scope (17 cases, 13.4%). Comparison of the proportion of practice-beyond-scope negligence among different hospital categories revealed statistically significant differences ($P < 0.05$). Pairwise comparisons showed that the proportion of practice-beyond-scope negligence in tertiary hospitals was significantly higher than in primary-level and secondary hospitals ($P < 0.016$).

Conclusion: From the perspective of the Beijing municipal standard, the primary root causes of medical negligence in primary-level hospitals are poor physician-patient communication quality, inappropriate treatment protocol formulation, non-standard medical record documentation, and practice beyond scope. Targeted corrections can improve medical quality in primary-level hospitals and safeguard the legitimate rights and interests of both physicians and patients.

Full Text

1.1 Data Collection

We retrieved 127 final judgments from China Judgments Online (wenshu.court.gov.cn) issued by Beijing courts at various levels between 2019 and 2022, where medical damage claims were filed against Beijing primary hospitals. Inclusion criteria were: (1) the medical treatment concluded between 2019 and 2022; and (2) the judgment represented a final ruling. Exclusion criteria were: (1) judgments that found Beijing medical institutions not liable during patient treatment; and (2) judgments lacking forensic appraisal opinions.

1.2 Analytical Method

Since forensic appraisal is based on the principle of whether "the diagnosis and treatment behavior conforms to the local medical capabilities at the time and place where the medical behavior occurred," the local standard *Code Specification for Key Control Points of Medical Behavior* can effectively identify critical control points for medical errors in Beijing primary hospitals. Our research team analyzed forensic appraisal opinions adopted by the courts using this code to determine key control points of medical errors. The *Code Specification for Key Control Points of Medical Behavior* was drafted by the Beijing Hospital Management Center to establish coding specifications for key control points in medical practice, primarily covering issues such as poor doctor-patient communication, unstable treatment plans, inadequate medical record documentation, and practice beyond authorized scope. Key control points were identified through expert meetings comprising 13 specialists in clinical medicine, hospital management, and medical law. When unanimous agreement among experts was less than 11 (84.6%), additional expert interviews or consultations were conducted until consensus exceeding 85.0% of all experts was achieved.

1.3 Statistical Analysis

We used SPSS 22.0 to establish a database for statistical analysis. Categorical data were expressed as relative frequencies, with inter-group comparisons performed using chi-square tests or Fisher' s exact test. Statistical significance was defined as $P<0.05$. For multiple pairwise comparisons, the Bonferroni method was applied with $P<0.05$ indicating statistical significance.

2.1 Overall Situation of Medical Error Cases in Beijing Primary Hospitals

Between 2019 and 2022, Beijing courts issued 179 medical damage judgments involving primary hospitals, with 127 cases (71.0%) finding fault in the hospitals' diagnosis and treatment behavior. Among these 127 cases, 26 (20.5%) involved public hospitals and 101 (79.5%) involved private hospitals. Our study identified 143 root causes of medical errors, with 139 (97.2%) confirmed through expert meetings and 4 (2.8%) requiring additional expert interviews or consultations (involving 7-11 additional experts). The leading root cause was poor doctor-patient communication (32 cases, 25.2%), followed by unstable treatment plans (31 cases, 24.4%), inadequate medical record documentation (23 cases, 18.1%), and practice beyond authorized scope (17 cases, 13.4%).

2.2 Comparison of Key Control Points by Hospital Nature

No statistically significant difference was found in the distribution of key control points for medical errors between public and private hospitals ($P>0.05$) .

2.3 Comparison of Key Control Points by Hospital Level

We randomly selected concurrent medical damage judgments involving primary (127 cases), secondary (28 cases), and tertiary hospitals (212 cases) for comparison. The results showed no statistically significant differences in the proportions of poor doctor-patient communication, unstable treatment plans, or inadequate medical record documentation across hospital levels ($P>0.05$). However, the proportion of practice beyond authorized scope differed significantly ($P<0.05$). Pairwise comparisons revealed that tertiary hospitals had a significantly higher proportion of practice beyond authorized scope than primary and secondary hospitals ($P<0.016$) .

3.1 Poor Doctor-Patient Communication Quality

Poor doctor-patient communication has become an urgent issue for medical institutions and healthcare professionals, representing a key point of widespread criticism from society in recent years.

3.1.1 Current Situation

Traditionally, primary hospital physicians were believed to serve relatively stable patient populations with frequent follow-ups, allowing ample time for communication and mutual understanding. However, our study found that under the Beijing local standard framework, poor communication quality ranks as the primary cause of medical errors in primary hospitals, demonstrating direct causality with patient harm. Doctor-patient communication is an exchange between both parties aimed at treating disease and meeting health needs during diagnosis and treatment. Unlike general interpersonal communication, patients particularly crave care and compassion from medical staff during consultations, making them more sensitive to healthcare workers' language, expressions, gestures, and behavior. This requires medical personnel to think and problem-solve from the patient' s perspective, exchanging hearts and genuine emotions. Forensic appraisal findings revealed that physicians deemed responsible for poor communication quality primarily exhibited: (1) Incomplete history-taking, failing to grasp patients' full medical complaints and history, leading to diagnostic errors or missed diagnoses. This occurred more frequently in primary hospitals than in secondary or tertiary hospitals, reflecting significant deficiencies in history collection communication. (2) Inadequate explanation of treatment plans, failing to fully inform patients about treatment advantages, disadvantages, and precautions, or to clearly notify them of alternative options, thereby infringing on patients' right to informed consent and affecting treatment choice or compliance. Although primary hospital treatment plans are relatively simple compared to higher-level hospitals, the required disclosure content is not reduced, and patients' need for treatment understanding does not diminish with simplified plans. (3) Insufficient guidance on home rehabilitation precautions, causing patients to develop complications that they failed to address promptly and effectively. Throughout disease diagnosis and health management, both parties should engage in physician-led, comprehensive, multi-channel information exchange centered on disease, diagnosis, treatment, and health-related topics to scientifically guide patient care and rehabilitation, enabling consensus-building and trust-based cooperation to protect human health and advance medical development. Primary hospitals serve relatively stable patient populations with more opportunities for mutual understanding, which should facilitate harmonious doctor-patient relationships and better communication. However, our previous research also found that communication skills among general practitioners at Beijing community health service centers indeed require improvement.

3.1.2 Suggestions for Improvement

(1) Establish standardized communication mechanisms. Our preliminary investigation found that most primary hospitals lack robust communication mechanisms, with doctor-patient communication relying on individual work habits and conventional practices, resulting in personalized and random communication content and timing. Under the Beijing local standard framework,

establishing effective doctor-patient communication can not only reduce medical errors in primary hospitals but also substantially enhance patients' sense of gain during medical encounters. Primary hospitals should establish standardized communication mechanisms specifying: mandatory communication timing; standardized and written communication content that remains personalized to patient conditions; and requiring signatures from both parties after communication.

(2) Strengthen training in humanistic medical practice skills to improve communication abilities. For a considerable period, medical education has emphasized professional knowledge and technical skills while neglecting humanistic quality cultivation, leaving medical personnel without effective methods for patient communication. Previous research demonstrated that systematic and regular training in humanistic medical practice skills can effectively improve primary hospital physicians' communication abilities. Therefore, we recommend: increasing the weight of humanistic quality assessment in new employee recruitment to prevent clinically incompetent medical students from entering practice; adding humanistic medical practice skills training to continuing education programs in a systematic and regular manner; and regularly assessing physicians' communication abilities with documented records, providing targeted psychological counseling for those with persistently poor performance.

(3) Address medical staff mental health and alleviate burnout. Healthcare workers indeed face considerable pressure in clinical practice, making it difficult to always maintain a proper demeanor during doctor-patient communication. Our previous research found that Beijing medical personnel experience relatively heavy occupational burnout requiring intervention measures. We recommend: leveraging hospital party, youth league, and union organizations to genuinely care for staff physical and mental health, helping frontline workers resolve practical difficulties; regularly organizing psychological stress-reduction activities; and inviting psychological experts to provide targeted counseling when needed.

(4) Establish and promote positive images of hospital medical staff. Harmonious doctor-patient relationships are built on mutual trust. When medical staff hold high stature in patients' minds, communication becomes more effective. We recommend: establishing honor boards for frontline medical staff to publicize outstanding deeds; creating opportunities to promote hospital specialties and social responsibilities within the community; and utilizing various channels to publicize exemplary medical staff to increase patient trust.

3.2 Unstable Treatment Plans

Providing appropriate and effective diagnosis and treatment services is the fundamental purpose of all medical institutions. Due to historical issues, most primary hospitals face hardware deficiencies such as lack of medical equipment and software shortcomings including talent shortages, relatively low technical

levels, and inadequate non-technical services, making them prone to medical disputes.

3.2.1 Current Situation

Our study found that under the Beijing local standard framework, unstable treatment plan formulation represents the second leading cause of medical errors in primary hospitals. Although this root cause showed no statistical significance compared with secondary hospitals, its incidence was higher than in tertiary hospitals. Main manifestations include: (1) Delayed or incomplete diagnosis, resulting in missed or erroneous diagnoses. Timely, accurate, and comprehensive diagnosis is the prerequisite for appropriate treatment. Due to insufficient professional knowledge and skills, primary hospital physicians have increased probability of missed or erroneous diagnoses when encountering patients with atypical symptoms, particularly limited by inadequate laboratory and auxiliary examination methods. (2) Poor matching between treatment plans and patient conditions. Although primary hospitals mainly treat common and frequent diseases with relatively fixed treatment protocols, these protocols continuously evolve with medical research advances, and relevant guidelines are updated accordingly, sometimes even overturning previous treatments. Our study found that primary hospital physicians' treatment plans occasionally conflicted with current disease treatment guidelines, constituting medical errors in forensic appraisal. (3) Inadequate and untimely detection and management of treatment-related complications. No treatment plan can completely prevent complications. In the judicial perspective, complications causing patient harm do not exempt medical institutions from liability; only timely detection and active management can reduce or eliminate responsibility. Our study found that primary hospital physicians' untimely and inappropriate detection and management of treatment-related complications commonly caused patient harm.

3.2.2 Suggestions for Improvement

(1) Strengthen autonomous learning of professional knowledge. For medical personnel, professional learning is lifelong after graduation. Since objective examination methods are limited in primary hospitals, staff must enhance training in basic theory, knowledge, and skills. They should also be vigilant about patients whose symptoms and signs resemble common diseases, strengthening differential diagnosis to reduce missed and erroneous diagnoses. Hospital administrators should create an atmosphere encouraging autonomous professional learning by regularly organizing activities to share newly released guidelines, technical advances, and literature reviews, with staff presenting their learning outcomes to stimulate broader participation.

(2) Create opportunities for continuing education. Continuing education is essential for every medical professional' s growth. Primary hospital administrators should create learning opportunities, encouraging participation in academic activities and continuing education relevant to their specialties. Ad-

ditionally, they should utilize medical consortiums to send staff to higher-level institutions for further training, enabling them to master research advances in common and frequent diseases and apply updated treatment guidelines, thereby reducing medical harm and improving treatment outcomes.

(3) Establish mechanisms for monitoring patient condition changes. No two patients with the same disease are identical, requiring that "as diseases vary, treatments must also vary." Since primary hospitals mainly serve outpatients, continuous observation of condition changes is challenging. When diagnosis and treatment deviate, primary hospitals are more prone to misdiagnosis and missed diagnosis. Establishing mechanisms to monitor patient condition changes can institutionally ensure timely and effective follow-up for every patient, reducing errors and improving both medical quality and patient satisfaction.

3.3 Non-standard Medical Record Writing

Medical records represent not only objective descriptions of patients' diseases and fundamental data for medical research but also evidence in medical damage litigation. Our study found that non-standard medical record writing ranks third among common medical errors in Beijing primary hospitals under the local standard framework.

3.3.1 Current Situation

Traditionally, non-standard medical record writing in primary hospitals was believed to occur mainly in private institutions. However, our study found no statistically significant difference between public and private primary hospitals, indicating that non-standard documentation in public primary hospitals also constitutes an important cause of medical errors. Forensic appraisal results revealed that non-standard medical record writing primarily manifested as: (1) Failure to write records promptly. This most commonly occurred in outpatient settings. Medical staff often lack awareness that "medical records are evidence in litigation,"resulting in liability due to inability to provide proof during appraisal. (2) Overly brief documentation that fails to fully reflect the entire diagnosis and treatment process. This phenomenon occurs not only in primary hospitals but also in other levels. Our study found that overly brief records often made it difficult to reconstruct the treatment process, leading to hospital liability. Compared with secondary and tertiary hospitals where this manifested as incomplete sections of specialized examinations, primary hospitals more commonly summarized all physical examination findings simply as "negative." (3) Inability to provide complete records promptly during forensic appraisal. When medical disputes arise, timely record sealing protects both parties' legitimate rights and interests. Our study found some primary hospitals could not provide complete records promptly during appraisal, mainly due to inadequate implementation of medical record preservation management systems, resulting in incomplete sealed

records that were not recognized by patients even when complete records were provided later, leading to unfavorable appraisal results.

3.3.2 Suggestions for Improvement

(1) Strengthen training and practice in basic medical record writing skills. Medical record writing is a fundamental skill that every medical professional should master in medical school. Complete, objective, and timely documentation is a basic responsibility and obligation in clinical practice. Primary hospital administrators should prioritize medical record quality as a lever to improve overall medical quality.

(2) Enhance medical record management. The *Medical Record Writing and Management System* is one of 18 core medical systems issued by the National Health Commission. Primary hospital administrators should strengthen core system training for medical staff. Faithful implementation of core medical systems maximizes protection of both parties' legitimate rights and interests. Our study found that many primary hospitals' medical record management systems exist in name only, lacking standardized sealing procedures. Establishing standardized medical record management processes similar to tertiary hospitals can minimize liability due to inadequate record management. We recommend establishing a medical record sampling inspection system with a "Medical Record Quality Control Team" comprising hospital administrators, management personnel, and medical backbone staff to review sampled records for form, content, and litigation risk, addressing common issues through targeted training while legally and compliantly improving documentation. Additionally, strengthening record preservation and management is a crucial administrator responsibility that cannot be neglected even from the perspective of protecting the hospital' s own legitimate rights and interests.

(3) Establish a comprehensive electronic medical record system. Due to individual factors, administrators cannot guarantee all medical staff will consistently meet documentation standards. Therefore, primary hospitals should implement robust electronic medical record systems that use technical means to control documentation quality, systematically intercepting omissions such as missing items. Primary hospitals can customize electronic systems according to their characteristics—for example, automatically generating patient history from previous records if staff tend to neglect past medical history documentation, or using "pop-up" reminders for patient-specific characteristics such as special medication habits. Electronic systems can also incorporate functions like irrational prescription interception to monitor medical quality in real time.

3.4 Practice Beyond Authorized Scope

Strictly practicing within registered scope is a fundamental principle all medical institutions should follow. Our study found that practice beyond authorized scope ranks fourth among common medical errors in Beijing primary hospitals

under the local standard framework, with incidence significantly higher than in other hospital levels. Traditionally, this error was believed to occur mainly in private primary hospitals, particularly cosmetic surgery clinics, but our results showed no difference between public and private hospitals.

As primary hospitals enhance their treatment capabilities, they inevitably undertake new diagnostic and treatment projects not previously covered. Hospital administrators should closely monitor newly developed specialty services and promptly complete registration changes for practice scope to ensure compliance with laws and regulations.

Conclusion

The main root causes of medical errors in Beijing primary hospitals under the local standard framework are poor doctor-patient communication quality, unstable treatment plan formulation, non-standard medical record writing, and practice beyond authorized scope. Targeted corrections can improve primary hospital medical quality and safeguard legitimate rights and interests of both physicians and patients.

Limitations

(1) This study only included court judgments for medical damage claims against Beijing primary hospitals, while a larger proportion of doctor-patient disputes are mediated through the Beijing Medical Dispute Mediation Committee, representing a limitation. (2) The study only included judicial decisions from 2019–2022, resulting in a relatively small sample size. Future research will expand the study subjects to provide more objective root cause analysis of medical errors in primary hospitals under the Beijing local standard framework, assisting these institutions in improving medical quality and better serving patients.

Author Contributions

Zhao Tiefu conceived and designed the study. Wang Na, Peng Jie, Tian Xuedi, Zhang Bo, Feng Yan, and Liu Huanhuan collected, organized, and entered data. Xu Xuemin and Liu Kai conducted root cause analysis. Zhao Tiefu and Ma Hanying took overall responsibility for the article.

Conflict of Interest

The authors declare no conflict of interest.

References

[1] Ministry of Health of the People' s Republic of China. *Hospital Grading Management Measures (Trial)*: Wei Yi Zi (89) No. 25[Z]. 1989.

[2] *Code Specification for Key Control Points of Medical Behavior: DB11/T 1645—2019*[S]. Beijing: Beijing Municipal Administration for Market Regulation, 2019.

[3] "Management Practice and Policy Choices for Building Harmonious Doctor-Patient Relationships" Research Group. What are doctor-patient relationships like in the United States?[J]. *China Health Talent*, 2016(9): 28-29.

[4] Deng Lili, Liao Xiaoyang, Wu Jia, et al. Implications of foreign doctor-patient communication models for communication skills training of general practitioners in China[J]. *Chinese General Practice*, 2021, 24(13): 1605-1609.

[5] Zhao Tiefu, Zou Xiaozhao, Zhou Hongdan, et al. Investigation on the current status of outpatient doctor-patient communication skills among general practitioners in Beijing[J]. *Chinese General Practice*, 2019, 22(4): 413-417.

[6] Zhao Tiefu, Xu Xuemin, Zhou Hongdan, et al. Study on the improvement of doctor-patient communication skills among outpatient doctors in Beijing tertiary A-level hospitals[J]. *Health Vocational Education*, 2019, 37(22): 121-123.

[7] Zhao Tiefu, Wang Xiangping. Relationship between job burnout and stress levels among cardiac surgeons in a Beijing tertiary A-level hospital[J]. *Chinese Journal of Health Education*, 2011, 27(5): 359-361.

[8] Hua Lei, Wang Xiangping, Zhao Tiefu, et al. Effect of stress management on mental health levels of emergency and intensive care unit medical staff[J]. *Chinese Hospitals*, 2012, 16(11): 19-21.

[9] Zhao Tiefu, Zhou Hongdan, Zhou Jingzhi, et al. Study on the impact of humanistic medical practice skills training for medical staff on outpatient satisfaction[J]. *Health Vocational Education*, 2020, 38(1): 121-123.

[10] Feng Qian, Feng Lei, Li Luochan. From medical quality safety to patient safety: Conceptual renewal and policy optimization of medical risk governance[J]. *Chinese General Practice*, 2019, 22(31): 3801-3805.

[11] Wang Ying. Causes and prevention strategies of medical disputes in community hospitals[J]. *China Rural Medicine*, 2011, 18(2): 70-71.

[12] Gu Guiguo, Tang Min, Wang Weiguo, et al. Analysis and prevention of common causes of medical disputes and accidents in community health service centers[J]. *Chinese Health Service Management*, 2013, 30(1): 24-26.

[13] Yang Kaiyan, Gao Shuai, Jiang Tao, et al. Analysis of misdiagnosis of atypical pulmonary sarcoidosis CT manifestations[J]. *Chinese General Practice*, 2017, 20(20): 2528-2531.

[14] Sun Xinran, Wan Heping. Current status and recommendations for continuing education training of general practitioners based on online training for common disease diagnosis and treatment knowledge at the primary level[J]. *Chinese General Practice*, 2021, 24(7): 875-880, 885.

[15] Song Jianwen, Zhang Fu, Yu Yangeng, et al. Discussion on classification of complications from the perspective of medical dispute appraisal[J]. *Journal of Jinzhou Medical University (Social Science Edition)*, 2020, 18(5): 12-15.

[16] Jiang Yuan, Jiang Lingjun, Liu Suzhen, et al. Study on monitoring behavior and influencing factors of chronic complications in community-managed type 2 diabetes patients[J]. *Chinese General Practice*, 2022, 25(1): 70-78.

[17] Zhao Tiefu, Xu Xuemin, Wang Tiejun, et al. Application of SWOT analysis in the management of hospital trainee physicians[J]. *Continuing Medical Education*, 2015, 29(3): 3-4.

[18] Chen Shupeng. Importance of medical record writing in determining medical fault[J]. *Medicine and Law*, 2019, 11(2): 70-75.

[19] He Jiwu, Fan Wufeng, He Dongquan, et al. Legal and ethical analysis of medical fault: Taking medical damage forensic appraisal of interstitial pneumonia as an example[J]. *Medicine and Philosophy*, 2022, 43(7): 28-30.

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Note: Figure translations are in progress. See original paper for figures.