

Discussion on Using PDCA to Improve the Quality of Medical Record Home Page and Operation Management Quality under DRGs Medical Insurance Payment Method

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Abstract: *Objective:* To understand whether PDCA cycle management can actually improve the quality of our hospital's medical record home page and the quality of operation and management under the DRGs medical insurance payment model. *Methods:* The medical records of 92 inpatients admitted to our hospital from January 2025 to December 2025 were selected as the research objects, and divided into experimental groups and conventional groups through the random number table method, with 46 cases in each group. The conventional group adopted ordinary medical record management and operation management methods, while the experimental group added PDCA cycle management based on conventional management. The quality scores of the medical record home page, the probability of occurrence of defects on the medical record home page, and related indicators of operation management were compared between the two groups. *Results:* After the intervention, the quality score of the medical record homepage of the experimental group was higher than that of the conventional group, the defect rate of the medical record homepage was lower than that of the conventional group, and the length of stay, average cost per hospitalization and probability of medical insurance refusal in operation management were all better than those of the conventional group ($P < 0.05$). *Conclusion:* PDCA cycle management can effectively improve the quality of our hospital's medical records under the DRGs medical insurance payment model, improve operational management efficiency, reduce the possibility of medical insurance refusal, and is suitable for promotion and application in clinical work.

Keywords: PDCA cycle; DRGs medical insurance payment; Medical record home page quality; Operation management quality

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1. Introduction

My country's medical security system is in a stage of continuous improvement. The DRGs' medical insurance payment method has been widely implemented in medical institutions at all levels. This payment method takes disease diagnosis grouping as the core point and clarifies the medical insurance payment amount based on the severity of the patient's condition, treatment methods, etc., and puts forward high requirements for the medical record management and operation

management of medical institutions. The home page of medical records is the core basis for grouping DRGs. The completeness and accuracy of its filling are directly related to the rationality of medical insurance payment, and will also affect the economic benefits and brand reputation of medical institutions^[1,2]. However, when our hospital currently uses the DRGs medical insurance payment model, problems such as irregular filling in the medical record home page, missing information, and coding errors are more prominent. In terms of operation and management, there are also unscientific hospitalization procedures, loose cost control, and high medical insurance refusal rates. These problems not only reduce the efficiency of use of medical insurance funds, but also restrict the improvement of the quality of medical services in the hospital^[3]. PDCA cycle management covers four parts: planning, execution, inspection, and processing. It has the characteristics of systematicness and a closed-loop nature. It has achieved good results after being applied in many fields of medical management^[4]. Based on this, this study applies the PDCA cycle management to the management and operational management of medical record homepages under the DRGs medical insurance payment model, and explores its actual effect in improving the quality of medical record homepages and operational management quality, providing a practical reference for our hospital to optimize the management model and adapt to the DRGs medical insurance payment reform.

2. Materials and methods

2.1. General information

The medical records of 92 inpatients admitted to our hospital from January 2025 to December 2025 were selected as research cases and divided into two groups using the random number table method. There were 46 patients in the experimental group, 25 males and 21 females, aged between 32 and 71 years old, with an average age of (48.62 ± 5.13) years old. There were 46 patients in the conventional group, 24 males and 22 females, aged from 33 to 72 years old, with an average age of (49.05 ± 5.08) years old. There was no statistical difference in the general data between the two groups, $P > 0.05$. Inclusion criteria: (1) Meet the requirements for hospitalization, and the hospitalization time is no less than 3 days; (2) The medical records are complete and capable of grouping DRGs; (3) The patients and their families are informed and cooperate with the research. Exclusion criteria: (1) Patients who died after emergency rescue and were discharged voluntarily; (2) Key information on the first page of the medical record is missing and cannot be supplemented; (3) Patients with combined mental illness and cognitive impairment who cannot cooperate with management.

2.2. Method

The regular group uses ordinary medical record management and operational management methods. Medical record management only involves medical record room personnel briefly checking the first page of the medical record after the patient is discharged. If any problems are found, clinicians will be notified for additional modifications. There is no fixed review and training system. Operation management follows traditional procedures to complete hospitalization registration, cost calculation, medical insurance reporting, etc., without optimizing the process and controlling costs based on the characteristics of DRGs medical insurance payment.

The experimental group added PDCA cycle management to conventional management. The specific implementation content is as follows:

- (1) In the planning stage, a special management group composed of key personnel from the medical department, medical record room, medical insurance department, finance department and clinical departments was established to comprehensively sort out the deficiencies in the quality and operation management of the medical record home page of our hospital under the DRGs medical insurance payment model, and determine the irregular filling of the home page, coding errors, complex operating processes, and costs. In order to address major issues such as insufficient management and control, we formulated corresponding management plans based on the actual situation of the hospital, clarified the responsibilities and work directions of each department, and set the expected goals of increasing

the quality score of the first page of medical records to above 90 points, controlling the defect rate within 5%, reducing the average hospitalization cost by more than 8%, and controlling the medical insurance denial rate within 3%.

- (2) In the execution stage, for the management of the medical record home page, organize clinicians, nursing staff and medical record coding personnel to carry out training on DRGs-related knowledge and filling requirements for the medical record home page, focusing on explaining disease coding principles, surgical operation coding specifications and important matters for filling in the home page. A centralized training and assessment will be organized once a month. A three-level review system for the first page of medical records has been established, with self-examination by clinicians, review by department quality control personnel, and final review by dedicated personnel in the medical record room to ensure that the information on the first page of each medical record is accurate and complete. For operational management, we optimize hospitalization-related processes, simplify admission registration, examination appointments, discharge settlement and other steps, and implement one-stop services. Strengthen cost control, conduct reasonable management and control of drugs, consumables, and examination items during hospitalization, and reduce unnecessary medical behaviors. The Medical Insurance Department arranges dedicated personnel to explain medical insurance policies and review applications, and promptly discover and correct problems in medical insurance reports.
- (3) In the inspection stage, the management team conducts random inspections on the quality of the first page of medical records every week, conducts comprehensive inspections every month, and collects statistics on the quality score, defect rate, and types of defects on the first page of medical records. At the same time, the relevant indicators of operation and management are regularly inspected, including length of stay, average cost per visit, medical insurance refusal rate, etc. The gap between actual completion and planned goals is compared, the causes of problems are analyzed, inspection results are formed and timely feedback is given to relevant departments.
- (4) In the processing stage, the problems discovered during the inspection are classified and summarized. For problems that can be rectified immediately, the relevant departments are required to complete the improvements within a designated time. For recurring common problems, such as coding errors, irregular filling, etc., we will conduct an in-depth search for the root causes, improve the training content and review system, and add effective rectification methods to daily management. For operational management indicators that have not met the planned requirements, we will optimize management measures, adjust the work direction, enter the next round of the PDCA cycle, and continuously improve the quality of management.

2.3. Observation indicators

2.3.1. Compare the quality of the medical record home pages between the two groups

Using the “Standards for Filling in the First Page of Medical Records” as the standard, the scores are scored from three aspects: information completeness, coding accuracy, and standardization of filling. The total score is 100 points. The higher the score, the better the quality of the first page of the medical records.

2.3.2. Compare the defects on the first page of medical records between the two groups

Count the number of defective cases on the first page of the two sets of medical records, including missing information, coding errors, filling errors, etc., and calculate the defect rate. The defect rate is the number of defective cases divided by the total number of cases and multiplied by 100%.

2.3.3. Compare two groups of operation management-related indicators

It includes the average length of stay, the average hospitalization cost and the medical insurance refusal rate. The medical insurance refusal rate is the number of medical insurance refusal cases divided by the total number of cases and multiplied by 100%.

2.4. Statistical methods

Data were analyzed using SPSS 24.0. Measurement data that conform to normal distribution are expressed as mean plus or minus standard deviation and subjected to t-test; count data are expressed as a percentage and subjected to χ^2 test. $P < 0.05$ indicates that the difference is obvious.

3. Results

3.1. Comparison of quality scores and defect rates of medical record home pages between the two groups

The quality score of the medical record home page of the experimental group was higher than that of the conventional group, and the defect rate was lower than that of the conventional group ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of quality scores and defect rates of medical record homepages between the two groups

Group	Medical record homepage quality score (mean \pm SD, points)	Defect rate of medical record home page [n (%)]
Regular group (n = 46)	75.36 \pm 6.28	12 (26.09)
Experimental group (n = 46)	92.15 \pm 4.32	2 (4.35)
Statistical value	14.940	8.425
<i>P</i>	0.000	0.004

3.2. Comparison of two groups of operation management-related indicators

After the intervention, the average hospitalization days of the experimental group were shorter than those of the conventional group, the average cost of hospitalization was lower than that of the conventional group, and the medical insurance denial rate was lower than that of the conventional group ($P < 0.05$). See **Table 2** for details.

Table 2. Comparison of operation management-related indicators between the two groups

Group	Average length of stay (mean \pm SD, days)	Average cost of hospitalization (mean \pm SD, yuan)	Medical insurance refusal rate [n (%)]
Regular group (n = 46)	8.72 \pm 1.35	8965.32 \pm 1256.78	8 (17.39)
Experimental group (n = 46)	6.25 \pm 1.12	8234.56 \pm 1089.45	1 (2.17)
Statistical value	9.550	2.980	4.434
<i>P</i>	0.000	0.004	0.035

4. Discussions

The full implementation of the DRGs medical insurance payment method has completely changed the previous charging-by-project model, closely linking the economic benefits of medical institutions with the quality of medical records and treatment efficiency. As the core basis for grouping DRGs, the quality of the medical record home page directly affects whether medical insurance payments are reasonable and accurate, while the quality of operation and management is related to cost control and long-term development of medical institutions. PDCA cycle management is a scientific management method. Through the closed-loop management process of planning, execution, inspection, and processing, it can effectively identify problems in management and continuously improve them. It is an important application in the field of medical management^[5]. This study applied PDCA cycle management to the medical record home page management and operation management under the DRGs medical insurance payment model. The results showed that all indicators of the experimental group were much better than those

of the conventional group, which is enough to show that this management model has practical effects.

The improvement of the quality of the first page of medical records is one of the core results of the application of the PDCA cycle management. After the intervention, the quality score of the first page of medical records in the experimental group was 92.15 ± 4.32 points, and the defect rate dropped to 4.35%, which was much better than the 75.36 ± 6.28 points and 26.09% of the conventional group. Such a result is mainly due to the PDCA cycle management sorting out major problems, such as missing information, coding errors, and irregular filling in the management of the medical record home page during the planning stage, so as to clarify the direction for subsequent management work. Targeted training carried out during the implementation phase effectively improves the professional capabilities of clinicians, nursing staff and medical record coding personnel, allowing relevant personnel to master the DRGs coding principles and the requirements for filling out the first page of medical records, reducing filling errors caused by insufficient professional capabilities; the establishment of a three-level review mechanism to implement The entire process of filling in the first page of medical records is quality controlled. Clinicians' self-examination can promptly discover and correct problems they identify. Department quality controllers' and final review by the medical record office are further strictly controlled to effectively prevent erroneous medical records from entering the next link, thus significantly improving the accuracy and completeness of the first page of medical records ^[6]. Regular spot checks and comprehensive inspections in the inspection phase can promptly discover new problems that arise in the management process and avoid the accumulation of problems; in the processing phase, by classifying and rectifying problems and improving mechanisms, effective rectification measures are incorporated into daily management to form a closed loop of continuous improvement to ensure that the quality of medical record pages can be maintained at a high level for a long time. Improving the quality of the medical record homepage can not only ensure the accuracy of DRGs grouping and avoid medical insurance denials due to grouping errors, but also provide reliable data support for hospital medical quality assessment and clinical research, and promote the overall improvement of hospital medical service quality.

The optimization of operational management quality is another important result of the application of the PDCA cycle management. After the intervention, the experimental group's average hospitalization days, average hospitalization costs and medical insurance denial rate were significantly better than those of the conventional group, with the average hospitalization days shortened to 6.25 ± 1 . In 12 days, the average cost of hospitalization dropped to 8234.56 ± 1089.45 yuan, and the medical insurance refusal rate dropped to 2.17%, which fully reflects the role of PDCA cycle management in optimizing operational efficiency, controlling costs, and reducing the risk of medical insurance refusal. In the planning stage, the management team combined the characteristics of DRGs' medical insurance payment to sort out the problems existing in operation management, such as cumbersome processes, insufficient cost control, and non-standard medical insurance declarations, and formulated targeted optimization plans to clarify the responsibilities and goals of each department and provide a clear direction for the optimization of operation management. In the execution stage, the hospitalization process is optimized to simplify admission registration, examination appointment, discharge settlement and other links, and promote one-stop service, reduce patient waiting time, improve diagnosis and treatment efficiency, and thereby shorten the average length of stay; the implementation of cost control measures, the integration of drugs, consumables, and examination items during hospitalization Management and control to avoid excessive medical treatment and waste of resources, effectively reduce the average cost of hospitalization, and improve the economic benefits of the hospital; the medical insurance department arranges dedicated personnel to be responsible for the interpretation of medical insurance policies and application review, promptly discover and correct problems in medical insurance applications, reduce medical insurance refusals due to irregular declarations, and reduce the rate of medical insurance refusals.

Regular monitoring of various indicators of operation management during the inspection phase can timely grasp the changes in indicators, compare the gap between the actual situation and the planned goals, and analyze the causes of problems. For example, long hospitalization days may be related to low efficiency of inspection appointments, and medical insurance refusal may be related to incorrect coding of medical records. In the processing phase, targeted rectifications are carried out to address these problems, optimize the inspection appointment process, strengthen coding training, continuously improve operation management measures, and form a closed-loop management, thereby continuously improving the efficiency and quality of operation management ^[7].

PDCA cycle management can simultaneously improve the quality of medical records and operational management. The core lies in its systematic and closed-loop characteristics. This model organically combines all aspects of management work to form a complete process of planning-execution-inspection-processing, avoiding the fragmentation and blindness problems that exist in traditional management. Under the DRGs medical insurance payment model, the quality of medical record homepages and the quality of operation management are interrelated and influence each other. Low quality of medical record homepages will lead to incorrect grouping of DRGs, which will in turn, affect medical insurance payment and increase the risk of medical insurance refusal. It will also affect cost accounting and efficiency evaluation in operations management. If the operation management process is not optimized and cost control is not in place, it will cause a waste of medical resources, affect the human and material investment in medical record management, and then affect the quality of medical record homepages. Through the collaborative management of the two, PDCA cycle management not only solves outstanding problems in the management of medical records, but also optimizes the operation management process to achieve positive interaction and collaborative improvement between the two^[8].

Taken together, PDCA cycle management is applied to medical record management and operation management under the DRGs medical insurance payment model, which can effectively improve the quality of medical records, reduce the defect rate of medical records, optimize the operation and management process, shorten the average length of stay, reduce the average cost of hospitalization and the medical insurance refusal rate, and improve the hospital's economic benefits and medical service quality. This management model meets the requirements of DRGs medical insurance payment reform, fits the actual management needs of our hospital, is simple to operate, highly feasible, and can achieve continuous improvement of management quality.

Disclosure statement

The author declares no conflict of interest.

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