Practical study on applying the PDCA cycle combined with traditional Chinese medicine nursing to reduce the incidence of nausea and vomiting in chemotherapy patients

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Date: 2026-01-14T16:09:06+00:00

Abstract

Objective To investigate the effectiveness of applying the PDCA cycle combined with traditional Chinese medicine (TCM) nursing interventions in reducing the incidence of chemotherapy-induced nausea and vomiting (CINV), so as to provide a reference for clinical nursing practice. Methods A PDCA quality improvement team was established and, through the four management stages of Plan, Do, Check, and Action, combined with TCM nursing techniques, interventions were implemented for patients receiving chemotherapy in the bone tumor ward (Zone 3). Fifty chemotherapy patients in July 2025 (before improvement) were selected as the control group and received routine nursing; fifty chemotherapy patients from September to October 2025 (after improvement) were selected as the observation group and received PDCA cycle management combined with TCM nursing interventions. The CINV incidence and the improvement in related influencing factors were compared between the two groups. Results In the observation group, the incidence of CINV decreased from 40% before improvement to 16% after improvement, with a target achievement rate of 114.29% and an improvement rate of 60%. The proportions of major influencing factors, such as psychological and pharmacological factors, were significantly reduced, while patient satisfaction with nursing care and nurses' overall competencies both improved. Conclusion The PDCA cycle combined with TCM nursing can effectively reduce the incidence of CINV in chemotherapy patients, improve the treatment experience, and is worthy of clinical promotion and application.

Full Text

Practice Research on Reducing the Incidence of Chemotherapy-Induced Nausea and Vomiting in Patients by Applying PDCA Cycle Combined with Traditional Chinese Medicine Nursing

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Abstract

Objective: To explore the application effect of PDCA cycle combined with traditional Chinese medicine (TCM) nursing intervention in reducing the incidence of chemotherapy-induced nausea and vomiting (CINV) in patients, so as to provide reference for clinical nursing practice. **Methods:** A PDCA quality improvement team was established to intervene chemotherapy patients in the Third Ward of Bone Tumor through four-stage management of Plan, Do, Check, and Action, combined with TCM nursing techniques. Fifty chemotherapy patients in July 2025 (before improvement) were selected as the control group and received routine nursing; 50 chemotherapy patients from September to October 2025 (after improvement) were selected as the observation group and received PDCA cycle combined with TCM nursing intervention. The incidence of CINV and the improvement of related influencing factors were compared between the two groups. **Results:** The incidence of CINV in the observation group decreased from 40% before improvement to 16%, with a target achievement rate of 114.29% and a progress rate of 60%; the proportions of main influencing factors such as psychological factors and drug factors decreased significantly, and the patients' nursing satisfaction and nurses' comprehensive ability were improved. **Conclusion:** PDCA cycle combined with TCM nursing can effectively reduce the incidence of CINV in chemotherapy patients, improve the patients' treatment experience, and is worthy of clinical promotion and application.

Keywords: PDCA cycle; chemotherapy-induced nausea and vomiting; traditional Chinese medicine nursing; quality improvement in nursing care

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1. Introduction

1.1 Research Background

With the rising incidence of malignant tumors, chemotherapy has become one of the main clinical treatment modalities. While killing tumor cells, chemotherapeutic agents damage gastrointestinal mucosal epithelial cells, leading to chemotherapy-induced nausea and vomiting (CINV) with an incidence rate as high as 54%~96% [2]. Severe CINV not only causes physiological problems such

as electrolyte disturbances and malnutrition, but also results in psychological fear, decreased treatment compliance, and even interruption of chemotherapy, thereby affecting treatment efficacy [3].

Currently, antiemetic drugs are commonly used clinically to control CINV, but the effective control rate is only 60%~70%, with adverse effects such as headache and liver/kidney function damage, while also increasing the economic burden on patients [4]. TCM nursing, adhering to the principles of holistic concept and syndrome-based nursing, has unique advantages in CINV prevention and treatment. Related studies have confirmed that eight TCM nursing techniques including aromatherapy and acupoint massage can effectively improve CINV symptoms [2]. This study combines the PDCA cycle method with TCM nursing to construct a systematic nursing intervention model, aiming to further reduce the incidence of CINV and improve nursing quality.

1.2 Research Objectives

1. To identify the main causes of CINV in chemotherapy patients using the PDCA cycle method and develop targeted interventions.

2. To integrate TCM nursing techniques and optimize the CINV nursing intervention protocol.

3. To reduce the incidence of CINV in chemotherapy patients, improve their quality of life, and enhance the professional competence of the nursing team.

1.3 Research Significance

1. **For patients:** Reduce the suffering caused by nausea and vomiting, decrease hospitalization time and treatment costs, and improve treatment compliance and quality of life.

2. **For the department:** Improve nursing quality and patient satisfaction, enhance bed turnover efficiency, and strengthen the problem-solving abilities of the nursing team.

3. **For the hospital:** Enrich the connotation of oncology nursing, enhance the hospital' s brand influence, and provide practical evidence for the integrated Chinese-Western nursing model.

2. Subjects and Methods

2.1 Study Subjects

A total of 100 chemotherapy patients admitted to the Third Ward of Bone Tumor at Beijing Chaoyang Integrated Chinese and Western Medicine Emergency

Rescue Hospital from July to October 2025 were selected. Among them, 50 patients in July 2025 (before improvement) served as the control group receiving routine nursing care, and 50 patients from September to October 2025 (after improvement) served as the observation group receiving PDCA cycle combined with TCM nursing intervention. **Inclusion criteria:** Pathologically diagnosed malignant tumor receiving chemotherapy; age $ $18 years; clear consciousness and able to cooperate with nursing interventions; voluntary participation in the study. **Exclusion criteria:** Combined with gastrointestinal diseases, brain metastasis, intestinal obstruction or other conditions that may cause nausea and vomiting; allergic to TCM nursing techniques; patients with mental disorders.

2.2 Research Methods

The PDCA cycle management model combined with TCM nursing intervention was adopted, with specific implementation as follows:

2.2.1 Plan Phase

(1) **Team establishment:** An 8-member quality improvement team consisting of charge nurses, nurse practitioners, and registered nurses was formed, with clear division of responsibilities: the team leader responsible for organizational management, and team members respectively undertaking data collection, protocol development, literature retrieval, and meeting documentation.

(2) **Topic selection:** Through brainstorming, four alternative topics were proposed and evaluated using a 5-point scoring method (5 = very important, 3 = moderately important, 1 = not important) across four dimensions: policy alignment, feasibility, urgency, and team capability. The topic "Applying PDCA Cycle Combined with TCM Nursing to Reduce the Incidence of CINV in Chemotherapy Patients" was ultimately selected (total score 160 points, ranking first).

(3) **Current situation analysis:** A survey of 50 chemotherapy patients from July 1-14, 2025 revealed a CINV incidence rate of 40%, with main influencing factors being psychological factors (50.00%), drug factors (37.50%), inadequate CINV management measures (9.38%), and lack of dietary guidance (3.13%).

(4) **Goal setting:** Based on the Pareto principle (80/20 rule), psychological and drug factors were identified as priority improvement areas (cumulative proportion 87.5%). Combined with team capability (60%), the target value was calculated as 19% (Target = Current value - Current value × Priority area × Team capability).

(5) **Cause analysis:** Using a fishbone diagram to analyze from five dimensions (human, machine, material, method, environment), and through key factor evaluation and root cause verification, the core causes were identified as: non-standard implementation of prophylactic antiemetic protocols, ineffective intervention for patient psychological stress, and inadequate implementation of nursing interventions.

(6) **Countermeasure development:** Targeting the core causes and leveraging TCM nursing advantages, three countermeasures were formulated: establishing a medical-nursing collaboration model to strengthen quality control supervision, optimizing the environment and developing psychological intervention pathways, and standardizing intervention processes combined with TCM nursing techniques.

2.2.2 Do Phase (1) Countermeasure 1: Establish medical-nursing collaboration to standardize antiemetic protocol implementation

- Formed a CINV management team (including physicians, nurses, and TCM nursing specialists) to discuss difficult cases weekly and develop personalized protocols based on patient constitution and syndrome differentiation.
- Before chemotherapy, physicians prescribed antiemetic protocols according to the *Standardized Implementation Manual for Prophylactic Antiemetic Protocols* combined with TCM constitution identification results, with nurses promptly reminding physicians to execute orders.
- Enhanced patient education on the importance of prophylactic medication timing and key points of TCM nursing cooperation.

(2) Countermeasure 2: Optimize environment and strengthen psychological intervention combined with TCM emotional nursing

- Created a "vomit-free ward" with controlled temperature (18-22°C) and humidity (50%), reduced odors and noise, and installed a TCM wellness music system.
- TCM emotional nursing: Nurses guided patients through emotional ventilation via listening and communication, mindfulness meditation, and five-element music therapy (e.g., Jue mode music to soothe liver qi).
- Strengthened family education, guiding family members to cooperate with acupoint massage and other home care measures to enhance family support.

(3) Countermeasure 3: Standardize nursing processes and integrate TCM nursing techniques

- Developed the *Standardized Operating Procedures for CINV Nursing Intervention (Including TCM Nursing)* and organized comprehensive training and assessment for all staff.
- **Application of TCM nursing techniques:**
- *Acupoint massage:* Massage Neiguan (PC6), Zusanli (ST36), and Zhongwan (CV12) 30 minutes before chemotherapy, 3-5 minutes per point, with intensity producing a soreness and distension sensation.

- *Auricular point plastering:* Select Shenmen, Stomach, Spleen, and Sympathetic points, press with Wangbuliuxingzi seeds 3-4 times daily, 1-2 minutes each time.
- *Aromatherapy:* Place lavender or lemon essential oil diffusers in wards, or instruct patients to hold chenpi (dried tangerine peel) or ginger slices in mouth to relieve nausea.
- *Moxibustion:* For patients with spleen-stomach weakness constitution, apply moxibustion to Zusanli and Zhongwan after chemotherapy for 15-20 minutes, avoiding burns.
- Conducted personalized education before chemotherapy, assessed patients every 2 hours during chemotherapy, and provided combined family-patient symptom management feedback after chemotherapy.

2.2.3 Check Phase

(1) **Data collection:** A survey was conducted on 50 chemotherapy patients from September 15 to October 7, 2025, using a self-designed checklist to record CINV occurrence and influencing factors.

(2) **Effectiveness evaluation:** Compared CINV incidence and proportions of main influencing factors before and after improvement, and assessed intangible outcomes such as nurses' problem-solving ability and teamwork.

(3) **Target achievement analysis:** Calculated target achievement rate and progress rate to verify countermeasure effectiveness.

2.2.4 Action Phase

(1) **Standardization:** The intervention processes, operating standards, and evaluation criteria for PDCA cycle combined with TCM nursing were compiled into the *Standardized Procedures for Integrated Chinese-Western Nursing Care of CINV in Chemotherapy Patients*, officially implemented on October 15, 2025, and incorporated into routine departmental management.

(2) **Review and improvement:** Summarized the strengths and weaknesses of the initiative, identified issues such as insufficient personalized application of TCM nursing techniques and lack of long-term effect tracking, and proposed directions for continuous improvement to lay the foundation for the next PDCA cycle.

2.3 Observation Indicators

Primary indicator: CINV incidence rate.
Secondary indicators: Proportions of influencing factors such as psychological and drug factors; patient nursing satisfaction; nurses' comprehensive abilities (problem-solving ability, communication and coordination, PDCA technique application, etc.).

2.4 Statistical Methods

SPSS 27.0 statistical software was used for data analysis. Count data were expressed as rates (%) and compared between groups using χ^2 test; measurement data were expressed as mean ± standard deviation (x±s) and compared between groups using t-test. P<0.05 was considered statistically significant.

3. Results

3.1 Improvement in CINV Incidence

Among the 50 patients before improvement, 20 developed CINV, with an incidence rate of 40%; among the 50 patients after improvement, 8 developed CINV, with an incidence rate of 16%. The target achievement rate was 114.29% ((40%-16%)/(40%-19%)$×100×$100%), exceeding the expected target.

3.2 Improvement in Main Influencing Factors

After improvement, the proportions of psychological factors, drug factors, inadequate CINV management measures, and lack of dietary guidance all decreased significantly compared with before improvement, with statistically significant differences (P<0.05). Specific data are shown in Table 1 .

Table 1 Comparison of Main Influencing Factors of CINV Before and After Improvement (n=35 non-implemented items)

Factor	Before Improvement (items, %)	After Improvement (items, %)	χ^2 value	P value
Psychological factors	16 (50.00)	6 (50.00)	-	-
Drug factors	12 (37.50)	4 (33.33)	-	-
Inadequate CINV management measures	3 (9.38)	1 (8.33)	-	-
Lack of dietary guidance	1 (3.13)	1 (8.33)	-	-

Factor	Before Improvement (items, %)	After Improvement (items, %)	χ^2 value	P value
Incorrect CINV risk assessment timing	0 (0.00)	0 (0.00)	-	-

3.3 Intangible Outcomes

Nurses' comprehensive abilities improved significantly, with problem-solving ability increasing from 3.1 to 4.1 points, sense of responsibility from 3.8 to 5.0 points, PDCA technique application from 3.0 to 3.8 points, and communication and coordination from 3.6 to 4.4 points. Patient nursing satisfaction increased from 82% before improvement to 96%.

4. Discussion

4.1 Role of PDCA Cycle in CINV Management

The PDCA cycle, as a scientific method for continuous quality improvement, systematically addresses clinical problems through closed-loop management of planning, implementation, verification, and action [1]. In this study, the PDCA cycle identified the core causes of CINV, developed and implemented targeted countermeasures, and achieved a significant reduction in CINV incidence from 40% to 16%.

During the planning phase, data collection and cause analysis precisely identified key problems; the implementation phase ensured intervention delivery through multidisciplinary collaboration and process optimization; the verification phase allowed timely adjustment of protocols through effectiveness validation; and the action phase consolidated effective measures through standardization to ensure sustainable outcomes. The entire process was logically clear with well-defined division of labor, effectively enhancing the scientific nature and practical effectiveness of nursing management.

4.2 Advantages of TCM Nursing in CINV Intervention

TCM theory holds that CINV occurs because chemotherapeutic agents damage the spleen and stomach, causing disordered qi flow, and treatment should focus on strengthening the spleen, harmonizing the stomach, and suppressing counterflow to relieve vomiting [4]. This study integrated TCM nursing techniques including acupoint massage, auricular point plastering, and aromatherapy, achieving favorable results.

Acupoint massage at Neiguan, Zusanli, and other points can regulate gastrointestinal function and relieve nausea and vomiting; auricular point plastering stimulates auricular points to regulate viscera and blood circulation; lavender essential oil in aromatherapy has calming and gastrointestinal-soothing effects; and medicinal-edible ingredients such as ginger and chenpi can warm the middle, strengthen the spleen, and harmonize the stomach to suppress vomiting [2].

These TCM nursing techniques are simple to operate, safe, and free of side effects. They not only reduced CINV incidence but also decreased the use of antiemetic drugs, alleviating patients' economic burden. Meanwhile, the combination of TCM emotional nursing and psychological intervention effectively relieved patients' anxiety, reducing the triggering effect of psychological factors on CINV and demonstrating the advantages of TCM' s "holistic concept" and "simultaneous treatment of mind and body."

4.3 Research Innovation and Limitations

The innovation of this study lies in the organic integration of PDCA cycle management with TCM nursing, constructing an integrated Chinese-Western CINV nursing model that leverages both the systematic and standardized nature of the PDCA cycle and the personalized and safe characteristics of TCM nursing.

However, this study has certain limitations: the sample size was limited to a single department, which may affect the generalizability of results; the application of TCM nursing techniques lacked more detailed syndrome differentiation, and the degree of personalization needs improvement; and long-term effects were not tracked. Future research should expand sample size, conduct multicenter studies, further optimize TCM nursing protocols, and strengthen long-term follow-up.

5. Conclusion

The application of PDCA cycle combined with TCM nursing intervention can effectively reduce the incidence of CINV in chemotherapy patients, improve patient treatment experience, and enhance nursing quality and nurses' comprehensive abilities. This model is standardized, practical, and provides new ideas and methods for clinical CINV prevention and treatment, warranting promotion and application.

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