Application of the CBL Teaching Method in a Nursing Lesson Plan for a Pediatric Patient with Pneumonia and Cough

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Abstract

This lesson plan utilizes the Case-Based Learning (CBL) method, taking a pediatric patient with pneumonia and cough of the phlegm-heat obstructing the lungs type as a case study. It conducts an in-depth discussion on the primary nursing issues of the patient, analyzes the case, proposes nursing diagnoses, formulates nursing plans, and explores ethical issues. The objective is to promote students' autonomous learning and deep analysis of the acquired Traditional Chinese Medicine (TCM) nursing knowledge. It enables students to gain profound practical experience in the clinical application of TCM cupping therapy in pediatrics and stimulates their proactive ability in learning TCM syndrome differentiation-based nursing.

Full Text

Application of Case-Based Learning (CBL) in a Nursing Lesson Plan for a Pediatric Patient with Pneumonia and Cough

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Abstract: This lesson plan utilizes the Case-Based Learning (CBL) method, centered on a pediatric case of pneumonia and cough characterized by the "phlegm-heat obstructing the lungs" syndrome. The plan involves an in-depth discussion of the patient' s primary nursing issues, case analysis, formulation of nursing diagnoses and plans, and an exploration of ethical considerations. The objective is to promote autonomous learning and deep analysis of Traditional Chinese Medicine (TCM) nursing knowledge among students. By engaging in

the clinical application of TCM cupping in pediatrics, students can enhance their practical skills and take initiative in learning syndrome-differentiation-based nursing.

Keywords: CBL teaching method; Pneumonia and cough (phlegm-heat obstructing the lungs type); Nursing lesson plan

Pneumonia and cough are common pulmonary conditions in children, with "phlegm-heat obstructing the lungs" being the most frequent syndrome type in TCM. Clinically characterized by fever, cough, and shortness of breath, these cases often require integrated TCM and Western medicine nursing. Case-Based Learning (CBL) is a student-centered, teacher-guided instructional method that uses clinical cases to guide learners in exploring, identifying, and solving problems while strengthening clinical thinking. As an interactive teaching model that bridges theory and practice [**?**], CBL has been shown to effectively improve the practical abilities of nursing students [**?**]. This paper applies the CBL method to TCM nursing education for this condition, providing a reference for enhancing students' proficiency in TCM external nursing treatments.

1.1 General Data

The patient is a female, aged 3 years and 1 month. Seven days prior to admission, she developed fever and anorexia without an obvious trigger. Her temperature peaked at 39.8°C five days ago. Three days ago, she developed a cough and wheezing with phlegm, which worsened two days ago. Her medical history includes congenital hypothyroidism treated with oral Euthyrox and a resolved case of varicella (chickenpox) in early 2024. She was hospitalized from October 17 to 22, 2024.

1.2 Physical Examination

Examination revealed pharyngeal congestion and Grade II bilateral tonsillar hypertrophy. Lung auscultation indicated coarse breath sounds with a small amount of fixed fine moist rales and phlegm sounds. Laboratory results showed a White Blood Cell (WBC) count of $7.00 \times 10^9/L$ (Neutrophils 56.10%, Lymphocytes 34.60%) and C-reactive protein (CRP) of 16.5 mg/L. A chest CT scan showed multiple patchy high-density shadows in the right lung and the lower lobe of the left lung.

1.3 Diagnosis

The Western medical diagnosis was bilateral pneumonia (severe). The TCM diagnosis was pneumonia and cough (syndrome of phlegm-heat obstructing the lungs). The TCM differentiation is based on the delicate nature of pediatric viscera; exogenous wind-pathogens invaded the lung defense system, transforming into heat and scorching fluids to form phlegm. This obstructed the airways, leading to cough, phlegm congestion, and fever. A red tongue with yellow greasy coating and a slippery, rapid pulse are characteristic signs of phlegm-heat.

1.4 Treatment

The patient was prescribed oral "Wuhu Decoction combined with Tingli Dazao Xiefei Decoction" (one dose daily, decocted in water and administered in two portions, morning and evening). This was supplemented every three days with pediatric massage (Tuina), moving cupping, and TCM cupping therapy to clear heat, resolve phlegm, and drain the lungs to relieve obstruction.

2.1 Nursing Assessment

The patient presented with fever, anorexia, and frequent paroxysmal non-spasmodic coughing. Phlegm was difficult to expectorate, and coughing frequently interrupted sleep at night. Despite these symptoms, her mental state remained good. Physical signs included pharyngeal congestion and Grade II bilateral tonsillar hypertrophy.

2.2 Nursing Diagnosis

The primary nursing diagnoses included: (1) Hyperthermia related to pulmonary infection; (2) Impaired gas exchange caused by pulmonary inflammation; (3) Ineffective airway clearance due to profuse, viscous secretions and the patient' s physical weakness; (4) Gastrointestinal dysfunction secondary to the respiratory infection; and (5) Congenital hypothyroidism based on neonatal screening results.

2.3 Nursing Plan

The plan aimed to reduce fever, relieve coughing, and resolve phlegm through oral TCM decoctions, pediatric massage every three days, and TCM cupping/moving cupping. Additionally, personalized health education was provided to the patient and her family.

2.4.1 Daily Life and Dietary Nursing

The ward environment was kept quiet with fresh air, ventilated twice daily for 30 minutes each. While in bed, the patient' s head and chest were elevated by no more than 30°, and her position was changed every 2 hours. Clothing was adjusted according to temperature changes to keep undergarments dry. Parents were instructed on proper back percussion to assist in phlegm expectoration. The diet was light and digestible, with an emphasis on variety and presentation to encourage appetite. During febrile periods, a liquid or semi-liquid diet was preferred, avoiding greasy or irritating foods. Feeding was prohibited during bouts of intense crying or coughing to prevent aspiration.

2.4.2 TCM Specialty Nursing

2.4.2.1 Oral TCM Administration: The "Wuhu Decoction and Tingli Dazao Xiefei Decoction" was administered daily. Due to poor compliance, the daily

dose was divided into 3–5 smaller portions while maintaining the total volume. Nursing staff monitored the patient' s temperature, perspiration, cough characteristics, and tonsillar status.

2.4.2.2 Pediatric Massage (Tuina): Specific acupoints were targeted: *Kaitianmen*, *Tuikangong*, *Yuntaiyang*, and *Rouerhougaogu* (100 times each) on the head; *Tiantu* and *Shanzhong* (1 minute each) on the chest; *Zusanli* and *Sanyinjiao* (100 times each) on the legs; and *Dazhui*, *Feishu*, *Geshu*, and *Weishu* (100 times each) on the back. For fever, *Qingtianheshui* and *Tuiliufu* (300 times each) were added.

2.4.2.3 TCM Cupping Therapy: Silicone "Miya" cups were used for both moving and stationary cupping. - **Moving Cupping:** A medium was applied to the back. The cup was moved from *Dazhui* down the Governor Vessel to *Mingmen*, and along the Bladder Meridian from *Feishu* to *Shenshu* until petechiae (Sha) appeared. - **Stationary Cupping:** Suitable silicone cups were placed for 5–10 minutes at bilateral *Feishu*, *Gaohuang*, and *Ashi* points (positive auscultation areas at the lung base). Families were advised not to bathe the child for 24 hours following treatment, which was repeated every three days.

2.5 Nursing Evaluation

Following treatment, the patient' s fever subsided, and her appetite improved. Coughing became brief and limited to early morning or onset of sleep. She slept well, maintained a good mental state, and showed no pharyngeal congestion. Tonsillar hypertrophy reduced to Grade I. Her tongue was red with a thin white coating, and her pulse was floating.

2.6 Clinical Outcome

At a follow-up one week after discharge, the pulmonary infection had cleared without complications. All clinical indicators had returned to normal, and the family reported high satisfaction. The patient was free of cough, phlegm, and nasal congestion, with improved appetite and sleep.

3.1 Teaching Context

The participants were three primary-level trainees undergoing advanced studies in our department. These students had already completed basic training in TCM and Western medicine nursing theory. This course built upon that foundation, using a clinical case to master the application of TCM cupping in pediatrics and to introduce pediatric massage. The case background—highlighting the relief of persistent fever and difficult expectoration through TCM techniques—was presented to stimulate student interest and confidence.

3.2 Teaching Objectives

1. **Cognitive:** Master integrated nursing assessment and diagnostic points for "phlegm-heat" pneumonia and cough; understand the etiology and nursing considerations for congenital hypothyroidism.
2. **Skill:** Master TCM cupping techniques and syndrome-based acupoint selection; become familiar with TCM specialty nursing protocols (oral meds, massage) and their precautions.
3. **Emotional:** Cultivate a dedication to the nursing profession and a commitment to patient care.
4. **Ideological:** Develop professional ethics, quality, and the capacity for humanistic care.

3.3 Teaching Methods

The CBL method was implemented through problem analysis, discussion, and practical operation [**?**]. Case data were presented in stages, accompanied by a series of nursing-related questions. Students engaged in discussions and proposed nursing plans, followed by teacher feedback and practical demonstrations.

3.4 Teaching Implementation

The instructor introduced the case and guided students to identify the necessary nursing skills. A student played the role of the patient for demonstrations of pediatric massage and cupping. This situational approach encouraged students to discuss precautions, summarize procedural steps, and identify suitable populations for these treatments.

3.4.1 Case Distribution and Preliminary Analysis: Detailed case materials were distributed 24 hours in advance. Students were tasked with reviewing TCM theory, pediatric acupoints, and the pathophysiology of pneumonia and hypothyroidism to perform a preliminary assessment.

3.4.2 Case Discussion: - **Theory (2 periods):** A PPT presentation covered the principles, indications, techniques, and equipment (Miya cups) for TCM cupping. - **Demonstration (2 periods):** The instructor demonstrated cupping and massage, emphasizing pediatric-specific precautions and acupoint selection. - **Analysis (4 periods):** Students discussed the accuracy of their diagnoses and the rationality of their nursing plans. Key topics included improving medication compliance, precise acupoint localization, and adjusting cupping pressure/duration based on syndrome differentiation. The instructor introduced guiding questions, such as how to manage the patient' s concurrent hypothyroidism during TCM procedures.

3.4.3 Practical Practice: After the demonstration, students practiced on each other under supervision. The instructor corrected techniques in real-time and reiterated the importance of monitoring the patient' s reaction to avoid overstimulation.

3.4.4 Summary and Reflection: Students explained their rationale for acupoint selection before performing procedures. The instructor provided comprehensive feedback, highlighting strengths and identifying omissions (e.g., missing hypothyroidism-related care points). The session concluded with student self-reflection on key knowledge points and areas for improvement.

3.5 Evaluation

3.5.1 Objective Achievement: The teaching activity successfully met its goals. Students mastered the assessment and diagnosis of the target condition, understood the complexities of the comorbid hypothyroidism, and demonstrated proficiency in TCM cupping and massage protocols.

3.5.2 Teaching Effectiveness: Overall effectiveness was high, with strong student engagement. Students demonstrated the ability to perform TCM cupping independently and apply TCM nursing in simulated clinical environments. The interactive nature of the method effectively bridged the gap between theory and practice.

3.5.3 Feedback: Students reported that the case-based and simulated learning made abstract TCM theories more concrete and easier to understand, providing a clearer path for clinical application.

Discussion and Conclusion

Pneumonia and cough are major pediatric respiratory diseases characterized by fever, cough, and dyspnea [**?**]. TCM theory suggests that children' s delicate constitutions make them susceptible to exogenous pathogens. In the early stages of pneumonia, TCM cupping can effectively clear heat, activate collaterals, and promote the absorption of pulmonary rales [**?**].

The CBL method offers significant advantages in nursing education by using real cases as vehicles for learning [**?**]. It encourages active acquisition of skills and fosters the ability to perform syndrome-differentiation-based nursing [**?**, **?**]. By breaking the limitations of traditional lecture-based teaching [**?**], this approach facilitates the transformation of theory into practice [**?**]. While this case demonstrated the effectiveness of CBL in improving the skills of primary-level nursing staff, the study is limited by its focus on a single case. Future efforts should explore a wider variety of cases and resources to further enhance the scientific rigor and utility of clinical teaching.

Ethical Statement: Informed consent was obtained from the patient' s guardians for the publication of this case. **Conflict of Interest:** The authors declare no conflicts of interest.

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