

Teaching Reform of Clinical Medicine Gastroenterology Based on Case-Based Learning and Experiential Teaching Concepts

Xinli Feng, Meng Sun*

Affiliated Hospital of Hebei University, Baoding 071000, Hebei Province, China

*Corresponding author: Meng Sun, sunmeng135135@sina.com

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Abstract: *Objective:* To explore the value of the application of case-based learning (CBL) and experiential teaching concepts in the teaching reform of clinical medicine gastroenterology. *Methods:* 70 clinical medicine students who interned in the Department of Gastroenterology of our hospital from May 2022 to April 2023 were selected and divided into the control group and the study group of 35 each using the mean score method. The CBL teaching model was adopted in the control group and the CBL combined with experiential teaching model was adopted in the study group. At the end of the internship, Mini-CEX (mini-clinical evaluation exercise) scores, medical record writing scores, and teaching satisfaction surveys were applied to assess the teaching effects of the two groups. *Results:* All scores in the Mini-CEX evaluation scale of the students in the study group were higher than those of the control group ($P < 0.05$); the assessment scores of the students in the study group in the areas of chief complaint, history of other diseases, and psychiatric examination were significantly higher than those of the control group ($P < 0.05$); and the teaching satisfaction of the students in the study group was higher (94.29%) than that of the control group (71.43%), and the difference was statistically significant ($P < 0.05$). *Conclusion:* The teaching effect of clinical medicine gastroenterology based on CBL and experiential teaching concepts is good, which can effectively improve the theoretical and practical performance of interns and increase teaching satisfaction, and it is worth popularizing and applying in the practice of clinical teaching reform.

Keywords: Case-based learning teaching; Experiential teaching; Medical education; Teaching reforms

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1. Introduction

Clinical internship is a key link in medical education and an important stage in the transformation of medical students from theoretical learning to clinical practice. During this process, students accumulate clinical experience through actual participation in patient care, diagnosis, and treatment, so as to better understand and apply what they have learned, help them develop their communication skills, clinical thinking, and sense of professional responsibility, thus laying a solid foundation for their future medical work^[1]. With the continuous development of China's medical and healthcare programs in recent years, higher demands have been placed on

the comprehensive quality of clinicians, and for this reason, it is necessary to continuously carry out reforms in medical education and innovate the teaching methods of clinical education, so as to cultivate medical students with better job competence. Case-based learning (CBL) teaching method is a commonly used method in the teaching of clinical education at this stage, the core of which is based on real cases, with students as the main body and the teacher as the guide of the modern teaching model [2]. Based on specific teaching objectives in CBL teaching practice, teachers provide students with specific case scenarios, so that students use the theoretical knowledge they have mastered, analyze and solve the problem through independent thinking and group discussion, thereby realizing the consolidation of theoretical knowledge and the practice of clinical practice [3]. However, due to the different clinical symptoms and signs of patients in gastroenterology, this kind of learning focusing on specific cases cannot comprehensively cover the wide spectrum of diseases in gastroenterology, which makes the students unable to cope with the complexity of the clinical scenarios and restricts the development of their integrative thinking and adaptability. To remedy this shortcoming, this study attempts to integrate experiential teaching concepts into CBL teaching in clinical medicine gastroenterology, in order to realize the innovation of clinical education pedagogy and contribute to the promotion of clinical education reform.

2. Study subjects and methods

2.1. Study subjects

70 clinical medicine students who interned in the Department of Gastroenterology of our hospital from May 2022 to April 2023 were selected and divided into the control group and the study group of 35 students each using the mean score method. In the control group, there were 19 males and 16 females; the age range was 18–23 years with a mean age of 22.06 ± 0.45 years; and the CBL teaching mode was adopted. In the study group, there were 17 males and 18 females; the age range was 18–23 years, with a mean age of 22.31 ± 0.55 years; and the CBL with experiential teaching model was adopted. Both groups of students voluntarily participated in this study, and the general information was compared, the difference was not statistically significant ($P > 0.05$).

2.2. Teaching methods

The instructors of both groups were attending physicians or deputy chief physicians with more than 3 years of clinical work experience in the department, and the teaching materials were compiled by the department, with 60 lessons (theoretical lectures + clinical practice).

The CBL teaching mode was adopted in the control group. During the teaching, the teacher designed the teaching program according to the syllabus, focusing on the pathogenesis, clinical manifestations, differential diagnosis, treatment, and prognosis of common gastroenterology diseases. Then they introduced the teaching with typical cases in the department, which triggered students' interest in exploring the knowledge related to gastroenterology, made them understand the clinical reality of gastroenterology and surgical diseases intuitively, and realized the concretization of abstract theoretical knowledge so that the students could understand and absorb it more easily. In the process of case analysis, the teacher put forward the clinical manifestations, physiology and pathology of gastroenterological diseases, differential diagnosis, and other related basic questions to help students deepen their understanding of the characteristics of gastroenterological diseases, and prompted them to combine anatomy, pathology, etc. with the practical skills of gastroenterology, so as to better understand the key and difficult points of the teaching. In addition, the introduction of cases showed students the multidisciplinary integrated use of gastroenterology disease treatment processes, such as drug therapy, interventional therapy selection, and decision-making process, to enhance the students' theoretical knowledge mastery, enhance their ability to apply theories to practice, and lay a solid foundation for them to be excellent clinicians.

The study group adopted a joint CBL-experiential teaching model. The CBL teaching was the same as above. In the experiential teaching, members of each group took turns to act and simulate typical gastroenterological disease symptoms, while other students acted as receiving physicians to carry out diagnosis and treatment. During the process, the teacher carefully observed the students to complete the diagnosis and treatment process and provided timely corrections to the non-compliance with the process. This role-play not only deepened students' understanding of the characteristics of gastroenterology but also enhanced their clinical thinking and communication skills.

2.3. Evaluation indicators

- (1) Evaluation of teaching effect: After the completion of the teaching, the mini-clinical evaluation exercise (Mini-CEX) and the medical record writing scale were applied to evaluate the students' knowledge mastery and the standardization of medical record writing. The Mini-CEX evaluation scale focused on the history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, overall performance, etc. ^[4]. The scale was divided into three levels with a 9-point scale: 1–3 for substandard; 4–6 for standard; 7–9 for excellent. The medical record writing scale included 10 points for chief complaint, 30 points for current medical history, 10 points for other medical history (including past history, personal history, and family history), 20 points for psychiatric examination, 10 points for auxiliary examination, and 20 points for clinical diagnosis.
- (2) Teaching satisfaction survey: The questionnaire investigated the students' satisfaction with the teaching mode, including three options "very satisfied," "satisfied," and "dissatisfied." Students filled in the questionnaire according to their real feelings, and statistically analyzed the overall satisfaction. Total satisfaction = (Very satisfied + Satisfied) / Total number of students × 100%.

2.4. Statistical analysis

SPSS22.0.0 statistical software was applied to analyze and process the relevant data, and the measurement data were expressed by mean ± standard deviation (SD) and compared by *t*-test; the count data were expressed by [n (%)] and compared by χ^2 test. $P < 0.05$ was used to indicate that the difference was statistically significant.

3. Results

3.1. Comparison of Mini-CEX assessment scores between the two groups

The scores of each item of the Mini-CEX evaluation scale of the students in the study group in terms of history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, and overall performance were higher than those of the control group, and the difference was statistically significant ($P < 0.05$), as shown in **Table 1**.

3.2. Comparison of the performance on medical record writing assessment between the two groups

In medical record writing, the differences between the two groups of students in terms of current medical history, auxiliary examination, and clinical diagnosis were not significant ($P > 0.05$). However, the assessment scores of the students in the study group in terms of chief complaint, history of other diseases, and psychiatric examination were significantly higher than those of the control group, and the differences were statistically significant ($P < 0.05$), as presented in **Table 2**.

3.3. Comparison of students' teaching satisfaction between the two groups

Based on **Table 3**, students' satisfaction with teaching in the study group (94.29%) was significantly higher than that of the control group (71.43%), and the difference was statistically significant ($P < 0.05$).

Table 1. Comparison of Mini-CEX assessment scores between the two groups of students (mean \pm SD, points)

Groups	Medical history inquiries	Clinical examination	Professionalism	Clinical judgment	Communication effectiveness	Organizational effectiveness	Overall performance
Control group (n = 35)	5.12 \pm 0.64	5.23 \pm 0.87	5.38 \pm 1.02	5.21 \pm 0.87	5.42 \pm 0.71	5.39 \pm 0.76	5.61 \pm 0.93
Study group (n = 35)	6.06 \pm 0.72	6.24 \pm 0.79	6.75 \pm 0.79	6.31 \pm 0.67	6.53 \pm 0.68	6.77 \pm 0.65	6.49 \pm 1.13
<i>t</i>	5.7728	5.0846	6.2822	5.9264	8.9655	8.1638	3.5574
<i>P</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007

Table 2. Comparison of the performance in medical record writing assessment between the two groups (mean \pm SD, points)

Groups	Chief complain	Current medical history	Other medical history	Psychiatric examination	Auxiliary examination	Clinical diagnosis
Control group (n = 35)	8.33 \pm 0.45	25.39 \pm 2.77	9.17 \pm 0.66	17.29 \pm 1.04	9.14 \pm 0.68	18.77 \pm 0.81
Study group (n = 35)	8.74 \pm 0.63	26.01 \pm 1.87	9.52 \pm 0.71	16.31 \pm 0.97	9.43 \pm 0.71	19.01 \pm 0.92
<i>t</i>	3.1330	1.0975	2.1360	4.0768	1.7451	1.1583
<i>P</i>	0.0026	0.2763	0.0363	0.0001	0.0855	0.2508

Table 3. Comparison of students' teaching satisfaction in the two groups [n (%)]

Groups	Very satisfied	Satisfied	Dissatisfied	Total satisfaction
Control group (n = 35)	12 (34.29)	13 (37.14)	10 (28.57)	25 (71.43)
Study group (n = 35)	23 (65.72)	10 (28.57)	2 (5.71)	33 (94.29)
χ^2	-	-	-	6.4368
<i>P</i>	-	-	-	0.0112

4. Discussion

4.1. The value of joint CBL-experiential teaching method in clinical medicine gastroenterology

Clinical teaching in gastroenterology has strong comprehensive characteristics and has high requirements for interns' professional knowledge and practical skills. Therefore, in the practice of education and teaching, teachers should actively innovate the concept of education, follow the principles of taking students as the main body, stimulating students' interest in learning, improving students' theoretical basics and clinical practice skills, and flexibly choose diversified teaching modes and assessment methods to strengthen students' comprehensive abilities [5].

The CBL-experiential teaching model in clinical medicine gastroenterology combines the benefits of theoretical learning and hands-on practice to enhance student motivation and engagement by combining the theoretical analysis of CBL with the hands-on practice of experiential teaching and learning. The implementation of CBL enables students to explore and analyze complex clinical situations in a safe environment, learn how to gather and analyze information, formulate hypotheses, and develop diagnostic and treatment plans. Experiential teaching, on the other hand, provides a platform to simulate real clinical environments, enabling students to apply the theoretical knowledge they had learned in practice, effectively developing clinical judgment and decision-making skills. In addition, the integrated teaching model also emphasizes teamwork and communication, so that students consolidate their theoretical knowledge, improve their teamwork, and exercise their communication skills during the discussion in the case group. In the following experiential teaching session, the role-playing not only enhances the interaction between students but also enables them to experience the disease treatment process from the patient's perspective, which helps them to understand the patient's feelings and needs, thus realizing the cultivation of empathy and professional attitude and greatly enhancing the quality and effect of clinical medicine education.

4.2. Teaching reform practice of clinical medicine gastroenterology based on CBL and experiential teaching concepts

(1) Creating experiential teaching situations

In gastroenterology clinical teaching, teachers use high-fidelity simulators, patient role-playing, or virtual reality technology to realize the simulation of teaching scenarios in real clinical environments, so that students can directly observe and simulate the handling of a variety of clinical situations, and deepen their understanding of the complexity and diversity of gastroenterological diseases while enhancing their professional knowledge.

(2) Stimulating interest in learning

Stimulating students' interest in learning is an important way to improve the teaching effect. For this reason, when teachers carry out CBL-experiential teaching practice, they choose specific cases related to students' life experiences and with a certain degree of challenge, so that they can master the clinical manifestations of gastroenterological diseases, physiopathology, differential diagnosis, and other related knowledge through case study analysis, and then put forward reasonable questions in a targeted manner, so as to let the students realize knowledge accumulation in the experiential teaching environment and deepen their sensory experience, thus stimulating their learning initiative. The students can realize the accumulation of knowledge in the experiential teaching environment and deepen their sensory experience, thus stimulating their learning initiative ^[6].

(3) Building an atmosphere for teachers and students to learn together

In CBL-experiential teaching in gastroenterology, teachers should not only play the role of knowledge transmitter but also play the role of guide and participant in the learning process. This integrated teaching model emphasizes group discussion, case study, and role play, where teachers can discuss and solve clinical problems with students, thus creating an interactive and co-learning atmosphere, which not only enhances the teaching effect but also promotes teachers' understanding of students' thinking styles and learning needs.

(4) Strengthening the ability to transfer nursing knowledge

Strengthening students' ability to apply what they have learned to actual clinical care is an important goal of CBL-experiential teaching. In the simulated clinical environment, students not only need to diagnose the disease, but also formulate and implement an effective diagnosis and treatment plan, and

independently complete medical record writing, doctor-patient communication, physical examination, psychiatric examination, and so on. Through such practice, students can deepen their understanding of the diagnosis and treatment process of gastroenterology diseases and enhance their ability to apply their knowledge in a real clinical environment.

5. Summary

The results of this study showed that the results of the Mini-CEX evaluation scale of the students in the study group were higher than those of the control group in terms of history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, and overall performance ($P < 0.05$); when comparing the assessment scores of the medical record writing, the differences between the two groups in terms of current history, auxiliary examination, and clinical diagnosis were not significant ($P > 0.05$), but the assessment scores of the study group were higher than the control group in terms of chief complaint, history of other disease, and psychiatric examination ($P < 0.05$); and the teaching satisfaction of students in the study group (94.29%) was higher than that of the control group (71.43%). It can be seen that the teaching effect of clinical medicine gastroenterology based on CBL and experiential teaching concept is good, which not only effectively promotes the improvement of the overall quality of teaching, but also greatly stimulates the interns' interest in learning and improves their teaching satisfaction, which is worthy of being widely used in clinical teaching.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Zhuang J, Zhao S, Li Y, et al., 2023, Discussion on the Application Effect of Case Teaching Mode in Clinical Nursing Teaching in Gastroenterology, Proceedings of Modern Digestive and Interventional Diagnosis and Treatment Academic Forum and 2023 South China Rehabilitation Medicine and Nursing Research Academic Conference, Guangdong Tumor Rehabilitation Society. Guangdong Province, China, 3.
- [2] Tang J, Chen J, Xu Q, et al., 2023, A Hybrid Model of TBL, CBL, and PBL to Help Teaching Theory of Gastroenterology. *Education and Teaching Forum*, 2023(40): 171–175.
- [3] Lu D, Qin F, Qin Q, 2023, The Application of CBL Teaching Mode in the Teaching of Standardized Training of Gastroenterology Residents. *Journal of Snake*, 35(02): 270–272.
- [4] Xue Y, Yang L, Zhu Y, 2022, Application Practice of CBL Teaching Based on Mind Mapping Combined with Mini-CEX Assessment Method in Clinical Teaching of Digestive System Diseases. *Journal of Qiqihar Medical College*, 43(24): 2360–2364.
- [5] Yan X, Li T, 2021, Analysis of the Role of Experiential Teaching in Clinical Teaching of Hematology Nursing. *Health Career Education*, 39(20): 107–108.
- [6] Jin H, Zhu X, 2020, Research on the Effect of Task-Oriented Experiential Teaching Method on Improving Nursing Students' Clinical Practice Ability. *China Higher Medical Education*, 2020(07): 108–109.

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