Scholars Journal of Arts, Humanities and Social Sciences OPEN ACCESS
Abbreviated Key Title: Sch J Arts Humanit Soc Sci
ISSN 2347-9493 (Print) | ISSN 2347-5374 (Online)
Journal homepage: https://saspublishers.com

Application Research of SBL in Developing Evidence-Based Pharmacy Competencies Among Clinical Pharmacy Students

Qing Deng[1], Guihong HUANG[1*], Guojun Jiang[1], Wenyan Jiang[1], Lilin Deng[1], Qinghua Qin[1], Junhe Huang[1], Jiakui Yue[1]

[1]Department of Pharmacy, The Second Affiliated Hospital of Guilin Medical University, Guilin, Guangxi, 541199, China

DOI: https://doi.org/10.36347/sjahss.2025.v13i09.002 | **Received:** 02.07.2025 | **Accepted:** 06.09.2025 | **Published:** 09.09.2025

***Corresponding author:** Guihong HUANG
The Second Affiliated Hospital of Guilin Medical University, Guilin, Guangxi, 541199, China

Abstract **Original Research Article**

To reform traditional internship teaching in Introduction to Clinical Pharmacy and enhance its quality, this study explores the impact of scenario-based learning (SBL)on cultivating Evidence-Based Pharmacy (EBP) competencies among clinical pharmacy students. The study involved 120 third-year undergraduate students majoring in clinical pharmacy in the 5-year program at Guilin Medical University. Participants were grouped by enrollment year: 60 students formed the traditional teaching group, and 60 students formed the research group. The research group received instruction using SBL combined with EBP principles. The communication and consultation skills assessment scores and teaching satisfaction surveys of both groups were compared. Results revealed that the research group demonstrated significantly higher communication and consultation assessment scores than the traditional teaching group, with a statistically significant difference between groups (P<0.001). Satisfaction survey results indicated superior outcomes in four areas compared to the traditional teaching group: stimulating learning interest, enhancing teamwork capabilities, mastering pharmaceutical consultation knowledge and skills, and utilizing evidence-based pharmacy support, with statistically significant differences between groups (P<0.05).

Keywords: SBL; clinical pharmacy; EBP; internship training; teaching effectiveness.

INTRODUCTION

Clinical pharmacists are pharmaceutical experts who engage directly in patient-focused clinical treatment teams, performing medication therapy administration to guarantee appropriate clinical drug utilization. The United States is the origin of clinical pharmacy, with educational programs in this field commencing in the mid-20th century. Following fifty years of advancement, a comprehensive clinical pharmacy training program has been instituted, yielding a substantial cohort of proficient clinical pharmacists who have garnered international acclaim from their colleagues[1]. Clinical pharmacy education in China, as a discipline focused on teaching clinical pharmacists, commenced relatively recently and is still underdeveloped. Evidence-based pharmacy (EBP) is an essential element of clinical pharmacist practice. Consequently, fostering evidence-based practice competencies in clinical pharmacy students not only augments their professional acumen but also establishes a basic basis for their future careers in clinical pharmacy. Scenario-based learning (SBL) utilizes authentic clinical scenarios in which students adopt various roles within simulated contexts, thereby augmenting practical skills and problem-solving capabilities through experiential learning. Years of clinical clerkship instruction relying solely on traditional mentorship have demonstrated inadequacy in cultivating students' evidence-based pharmacy reasoning. This study seeks to investigate the efficacy of utilizing SBL in the practical instruction of Clinical Pharmacy Introduction. This simulation of the everyday tasks of clinical pharmacists aims to enhance students' application of evidence-based practice models and cognitive strategies, consequently offering novel perspectives and methodologies for the development of clinical pharmacy professionals.

METHODOLOGY

Research Subjects

This study involved 123 third-year undergraduate students enrolled in the five-year clinical pharmacy program at Guilin Medical University. After excluding three students who were on leave of absence or had transferred from other majors, a total of 120 students were included. They were grouped according to their

year of enrollment: 60 students from the Class of 2018 were assigned to the traditional teaching group, while 60 students from the Class of 2019 were assigned to the research group. In the traditional teaching group, there were 20 male and 40 female students; in the research group, there were 23 male and 37 female students. All participants had completed foundational courses in clinical pharmacy and possessed a certain level of professional knowledge and understanding of evidence-based pharmacy. There were no significant differences in general characteristics such as gender, age, or prior course performance between the two groups, indicating comparability.

Teaching Methods

The study was conducted in strict accordance with the teaching syllabus of the "Introduction to Clinical Pharmacy" course at Guilin Medical University, revised in September 2021. Before the intervention, all participants completed theoretical modules covering the procedures and content of pharmaceutical ward rounds and consultations by clinical pharmacists, as well as an introduction to the methods and steps of evidence-based pharmacy practice. The present study was implemented during the clinical practicum section of the course, which consisted of 12 hours of clinical placement divided into four separate sessions.

Traditional Teaching Group

The traditional teaching group received instruction via conventional lecture-based methods. In accordance with the teaching syllabus, knowledge was delivered through classroom lectures and PowerPoint presentations. Instructors introduced clinical case characteristics and conducted bedside medication consultations to impart relevant knowledge, followed by clinical practicum guidance.

Intervention Group

The intervention group was taught using SBL integrated with the concept of EBP. The specific implementation procedure was as follows: Before the intervention, the principal investigator conducted standardized training for all involved clinical pharmacists, covering the fundamental principles of SBL and the criteria for case design. Cases were developed based on the current clinical pharmacy specialties available at our hospital, covering six major domains: cardiovascular, endocrine, anticoagulation, respiratory, infectious diseases, and antitumor therapy. Three SBL cases were designed for each specialty, with each case containing more than five questions. Each case featured distinct disease conditions and unique problem sets. Case design followed these standards: [1] Disease selection: Diseases were chosen in accordance with the training guidelines of the Chinese Hospital Association for Clinical Pharmacists, ensuring that selected conditions and their treatment processes met evaluation requirements. [2] Medical history presentation: Case materials were compiled and summarized based on existing or classic medical records. Case histories were presented concisely, with key positive findings included without special emphasis. Drug therapies were clearly described, with treatment regimens designed to facilitate the identification of pharmaceutical care issues and reflect adjustments according to disease progression. Essential information was retained without omission, while some extraneous details were included for student discrimination. Professional terminology and generic drug names were used throughout. [3] Question design: Questions were hierarchically designed according to case specifics, with varying levels of difficulty. Each question was unambiguous and directly linked to the case context. Questions progressed from foundational to advanced levels, focusing on individualized patient scenarios. Emphasis was placed on the evaluation of drug therapy plans, patient monitoring, and medication education. Questions were structured at two levels: one focusing on the design and evaluation of drug regimens based on fundamental theories, and the other emphasizing clinical practicalities such as appropriate drug use. Topics included common clinical issues such as irrational use of antibiotics, management of adverse drug reactions, and dose adjustments in special populations. Each case incorporated key elements of evidence-based pharmacy practice. Additionally, before each practicum session, teaching aids such as simulated ward settings, medical records, and drug models were prepared to create an immersive clinical environment.

During implementation, the following procedures were conducted: [1] Literature Search: One week before each clinical clerkship session, a prepared SBL case was distributed via the class QQ group. Students were divided into teams of five based on their preferences, and each team was assigned an SBL case through random drawing. A team leader was elected to organize members, assign learning tasks, and allocate roles. Team members utilized databases (e.g., CNKI, Wanfang, PubMed) to conduct literature searches, review relevant materials, systematically evaluate various pharmaceutical research outcomes, analyze the rationality of medication use based on the case diagnosis and drug therapy, and discuss how to provide pharmaceutical care for the specific disease. Through mutual discussion, they shared perspectives, addressed questions posed in the SBL case, and developed corresponding pharmaceutical guidance and services. [2] Script Design: The team leader assigned roles for pharmacists and patients. Students collaborated in discussion-based learning under the guidance of clinical pharmacists specializing in relevant fields. After discussion and synthesis, roles were arranged according to the SBL case, and a script for pharmacist-patient dialogue during pharmaceutical consultations was designed. [3] Simulated Scenario Exercise: The team leader briefly introduced the clinical case. The group then performed a simulated pharmaceutical consultation

based on the prepared script. Roles such as "Pharmacist 1," "Pharmacist 2," and "Patient" were played by team members. This allowed students to experience the presentation of symptoms, questioning, and emotional communication from the patient's perspective, thereby understanding the patient's physical and psychological state, as well as to appreciate the pharmacist's mindset and communication process during consultations. "Pharmacist 1" was responsible for the primary consultation, while "Pharmacist 2" provided supplementary inquiries and medication guidance. At the end of the simulation, another team member summarized the approach to pharmaceutical care for the disease and answered questions from the SBL case. [4] Discussion and Summary: After the simulation, the instructor provided comments and guidance on each group's performance. Problems identified in each group were analyzed, corrective measures were proposed, and incorrect answers were rectified. The instructor also addressed student questions, facilitated group discussions, and encouraged class-wide exchanges to share practical experiences and insights. Existing issues and shortcomings were analyzed, with emphasis on the core principles and practical techniques of evidence-based pharmacy.

Teaching Evaluation

Teaching outcomes were assessed from two perspectives: students' comprehensive competence and student satisfaction. Students' comprehensive competence was evaluated during the final clinical clerkship session using a self-designed communication and consultation competency scale specifically for clinical pharmacy students, with a total score of 100. Student satisfaction was surveyed via anonymous questionnaires administered upon course completion. The self-developed questionnaire covered eight domains: curriculum design, teaching effectiveness, classroom atmosphere, stimulation of learning interest, enhancement of teamwork skills, acquisition of pharmaceutical knowledge and consultation skills, and the utility of evidence-based pharmacy. Responses were categorized into three levels: dissatisfied, basically satisfied, and very satisfied. The satisfaction rate was calculated as follows: number of basically satisfied + very satisfied）/total respondents ×100%.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics version 26.0. Continuous variables were expressed as mean ± standard deviation and compared using the student's t-test. Categorical variables were presented as numbers and percentages and compared using the chi-square (χ^2) test. A two-tailed P-value of less than 0.05 was considered statistically significant.

RESULTS

Evaluation Results of Communication and Consultation Skills in Clinical Pharmacy Students

In the assessment of communication and consultation competencies among clinical pharmacy students, the study group achieved a significantly higher score (85.88 ± 3.98) than the traditional teaching group (76.27 ± 5.91). The difference between the two groups was statistically significant ($P < 0.001$), as summarized in Table 1.

Table 1: Assessment of communication and consultation skills in the two groups

Group	Score on Communication and Consultation Skills	*t*	*P*
Intervention Group	85.88±3.98	10.46	＜0.001
Traditional Teaching Group	76.27±5.91		

Student Satisfaction Survey Results

A total of 120 valid questionnaires were collected after the course. The survey results demonstrated that overall satisfaction was significantly higher in the intervention group compared to the traditional teaching group. Significant differences were observed between the two groups in the following aspects: stimulating learning interest, enhancing teamwork skills, acquisition of pharmaceutical knowledge and medication consultation skills, and the supportive role of evidence-based pharmacy (all $P < 0.05$). In contrast, no statistically significant differences were identified in terms of curriculum design, teaching effectiveness, or classroom atmosphere ($P > 0.05$), as presented in Table 2.

Table 2: Comparison of student satisfaction between the two groups.

Gruop	Curriculum Design	Teaching Effectiveness	Classroom Atmosphere	Interest Stimulation	Teamwork Skills	Pharmacist Consultation Skills	EBP Utility
Traditional Teaching Group(n=60)	57(95.0)	57(95.0)	57(95.0)	52(86.7）	51(85.0)	49(81.7)	49(81.7)
Intervention Group(n=60)	59(98.3)	59(98.3)	60(100.0)	59(98.3)	59(98.3)	57(95.0)	59(98.3)
χ^2	0.259	0.259	1.368	4.324	6.982	5.175	9.259
P	0.611	0.611	0.242	0.038	0.008	0.023	0.002

DISCUSSION

With the continuous advancement of the medical and health system reform and the construction of the clinical pharmacist system, training clinical pharmacists who can meet actual clinical needs has become the most crucial task in the education of clinical pharmacy professionals [2]. Introduction to Clinical Pharmacy is a discipline that integrates both theoretical and practical instruction. It is a comprehensive subject focused on patient care, emphasizing the practical nature of clinical pharmacy as a field and the professional role of clinical pharmacists. The course covers the design of clinical medication regimens and pharmaceutical care plans, combining substantial theoretical depth with strong practical application [3–5]. The clinical pharmacy practicum serves as a vital component that bridges fundamental theoretical knowledge and clinical practice, enabling students to integrate and consolidate their learning. In traditional practical teaching, however, instructors often demonstrate medication history-taking techniques through bedside case introductions, while students remain passive recipients. This approach leads to weaknesses in practical training [6], manifesting as unclear medication consultation logic, insufficient attention to drug therapy, inability to develop individualized treatment plans and pharmaceutical care plans, and inadequate mastery of medication history-taking skills—all contributing to suboptimal learning outcomes. SBL is a teaching method in which instructors design targeted scenarios based on instructional content and objectives, allowing students to engage in role-playing. By simulating highly realistic situations, this approach helps students acquire knowledge and improve their competencies[7]. It greatly enhances students' enthusiasm and initiative and creates a dynamic classroom atmosphere [8]. EBP, an extension of evidence-based medicine into pharmaceuticals, was defined by Professor Wiffen P [9] as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of patients." EBP has been implemented in clinical pharmacy education in China and has shown certain teaching benefits [10,11]. By retrieving and evaluating evidence, students learn to formulate individualized medication regimens, monitor therapeutic outcomes, and contribute to rational drug use in clinical practice [12]. This process improves students' ability to search and synthesize literature and cultivates a rigorous, meticulous scientific attitude as well as innovative thinking skills [13]. Drawing on previous research experience, this study incorporates the integrated application of SBL and EBP concepts into teaching.

The results of this study demonstrate that in the assessment of communication and medication consultation skills among clinical pharmacy students, the intervention group achieved a significantly higher score (85.88 ± 3.98) compared to the traditional teaching group (76.27 ± 5.91), with a statistically significant difference ($P < 0.001$). This suggests that the application of SBL—which involves repeated student participation in simulated clinical scenarios—facilitates the integration of abstract theoretical knowledge with practical cases, thereby enhancing understanding and retention. Throughout the clinical problem-solving process, students were required to continually retrieve and apply what they had learned, including evidence retrieval techniques, to efficiently acquire and critically evaluate relevant evidence. By integrating this evidence with clinical experience and considering physician preferences, they developed rational medication plans. Repeated practice allowed students to experience success, increasing both engagement and motivation, which contributed to the marked improvement in consultation and communication skills. A teaching satisfaction survey indicated that the intervention group expressed higher satisfaction across all domains compared to the traditional group. Significant differences ($P < 0.05$) were observed in four areas: stimulation of learning interest, improvement of teamwork skills, mastery of pharmaceutical knowledge and consultation skills, and support in applying evidence-based pharmacy—a finding consistent with previous studies [14]. This reflects strong student approval for the integrated SBL and EBP approach in the practical curriculum of Introduction to Clinical Pharmacy. During role-playing activities, collaboration with team members helped foster teamwork and communication abilities. Moreover, within the complex clinical scenarios constructed through SBL cases, students practiced clinical pharmacy analysis and judgment, cultivating effective learning habits and independent critical thinking, thereby enhancing both evidence-based and clinical reasoning skills. These comprehensive competencies are essential for future clinical pharmacy practice. However, no significant differences were identified in three aspects: curriculum design, teaching effectiveness, and classroom atmosphere. This may be attributed to the inherently engaging nature of practical training courses, which typically feature more dynamic interactions than theoretical classes, or to students' familiarity with traditional teaching models. The limited sample size may also have influenced these results. Additionally, this study developed an SBL case library, which not only helped instructors identify gaps in their own clinical and instructional competencies—leading to improved professional and teaching skills—but also elevated the overall quality of clinical practical teaching. The case library provides a standardized yet flexible tool for future simulation-based teaching, enriching the instructional methods available within the department. It should be noted that this study has several limitations, including a small sample size drawn from a single medical university, which may affect generalizability. Furthermore, the short duration of the teaching effect

assessment prevented long-term follow-up. Future research should expand the SBL case library, incorporate multi-center studies, and include longer-term follow-up into subsequent internship phases to further validate and promote the application of this approach.

In summary, the application of SBL integrated with EBP principles in clinical pharmacy practicum teaching effectively promotes students' acquisition of EBP-related knowledge. Satisfaction surveys on practical evidence-based pharmacy practice indicate noticeable improvements in stimulating students' learning interest, enhancing teamwork skills, mastering pharmaceutical consultation knowledge and skills, and facilitating the application of evidence-based pharmacy. More importantly, SBL helps students develop a comprehensive understanding of the role of clinical pharmacists. Through situational simulations, students gain a more authentic appreciation of the responsibilities involved, which gradually shifts their learning attitudes and methods toward greater proactivity. Consequently, their self-directed learning ability and capacity to apply evidence-based pharmacy to solve practical problems are significantly enhanced. With the continuous advancement of the clinical pharmacist system and ongoing optimization of teaching methodologies, the integration of SBL and EBP concepts deserves further promotion in clinical pharmacy education to cultivate more highly competent clinical pharmacy professionals who can meet actual clinical demands.

Foundation items:

Special project of "Classroom Teaching Reform and Quality Improvement" of Education and Teaching Research and Reform of Guilin Medical University (No. JGZ202116); General project of Education and Teaching Research and Reform of Guilin Medical University (No. JG202323)

REFERENCES

1. Scarsi K. K., Prinz E. A., Snyder H. K., Olsen K. O., Zhang L., Zeng L., & Gui G. (2015). Development and Practice of Clinical Pharmacy in the United States. *Clinical Pulmonary*, *26*(26), 3601–3611.
2. Li L. (2015). Current Status, Issues, and Recommendations for the Development of Clinical Pharmacy in China. *Scientific and Technological Innovation*, *20*, 128.
3. Jiang X. (2014). *Introduction to Clinical Pharmacy (2nd Edition)*. People's Medical Publishing House.
4. Liu S.-, Li X., & Zhu Z. (2009). *Clinical Pharmacy*. Peking University Medical Press.
5. Ma G., Cai W., & Xu D. (2017). *Introduction to Clinical Pharmacy*. Science Press.
6. Yan G., Du Z., Wu Y., & Sun J. (2014). Current Status of Clinical Pharmacy Education in China and Recommendations for Its Development. *Pharmaceutical Education*, *30*(6), 19–22.
7. Zhou X., Ji T., He Y., Cao W., Wang L., Fang X., & Zhang C. (2021). Exploration and practice of PBL combined with Scenario-based learning in Oral & Maxillofacial—Head & Neck Oncology Teaching. *Chinese Journal of Otorhinolaryngology in Integrative Medicine*, *29*(5), 384–386, 380.
8. Beal, M. D., Kinnear, J., Anderson, C. R., Martin, T. D., Wamboldt, R., & Hooper, L. (2016). The Effectiveness of Medical Simulation in Teaching Medical Students Critical Care Medicine. *Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare*, *12*(2), 104–116.
9. Wiffen, P. (2001). *Evidence-based pharmacy*. R adcliffe Medical Press.
10. Cheng L., Sun F., & Xia. (2019). Strengthening Evidence-based Pharmacy Education in Clinical Pharmacy Education. *Pharmaceutical Education*, *35*(2), 10–12.
11. Costa de Sousa, I., Pereira de Lima David, J., & Noblat, L. de A. C. B. (2013). A Drug Information Center Module to Train Pharmacy Students in Evidence-based Practice. *American Journal of Pharmaceutical Education*, *77*(4), 80.
12. Cao S., Xu C., & Wang Y. (2021). Reflections on the Application of the CBL+SPOC+EBP Teaching Model in Pharmacology Education. *Science & Technology Vision*, *19*, 121–122.
13. Shen Z., Xu Z., & Jin M. (2018). Integration of Evidence-Based Pharmacy into the Clinical Training of Undergraduate Pharmacy Students. *Health Vocational Education*, *36*(9), 108–109.
14. Zhu T., Zhu M., & Li P. (2019). Analysis of the Effect of Scenario-Based Teaching Method on Clinical Pharmacotherapeutics Education. *China Continuing Medical Education*, *11*(2), 32–34.