Journal of Contemporary Educational Research, 2026, Volume 10, Issue 4
http://ojs.bbwpublisher.com/index.php/JCER
Online ISSN: 2208-8474
Print ISSN: 2208-8466

Construction and Practice of a Standardized Training Teaching Model for Internal Medicine Residents Based on "Outpatient Competency"

Fang Li[1], Zhuxuan Lan[2], Jing Li[3]*

[1]Department of Infectious Diseases, Shaanxi Provincial People's Hospital, Xi'an 710068, Shaanxi, China
[2]Department of Medical Affairs, The Second Affiliated Hospital of Air Force Medical University, Xi'an 710032, Shaanxi, China
[3]Department of Gastrointestinal Endoscopy, Shaanxi Provincial People's Hospital, Xi'an 710068, Shaanxi, China

Author to whom correspondence should be addressed.

Abstract: *Objective:* To construct a standardized training teaching model for internal medicine residents based on "outpatient competency" and explore its application effects. *Methods:* Fifty residents undergoing standardized training in internal medicine at our hospital from January 2025 to December 2025 were selected as the study subjects. A self-controlled before-and-after study design was adopted to implement a teaching model based on "outpatient competency." The outpatient competency scores of residents (including eight dimensions: medical history taking, physical examination, interpretation of auxiliary examinations, diagnosis and differential diagnosis, formulation of treatment plans, doctor-patient communication, medical record writing, and emergency response), theoretical assessment scores, skill assessment scores, as well as the satisfaction of teaching faculty and patients were compared before and after the training. *Results:* After the training, the scores for each dimension and the total score of outpatient competency among the 50 residents were significantly higher than those before the training ($P < 0.05$). The theoretical assessment scores (89.63 ± 4.25 points vs 76.32 ± 5.18 points) and skill assessment scores (91.25 ± 3.86 points vs 78.54 ± 4.67 points) also significantly improved ($P < 0.05$). *Conclusion:* The standardized training teaching model for internal medicine residents based on "outpatient competency" can effectively enhance residents' core outpatient competencies, theoretical and skill levels, while improving the satisfaction of teaching faculty and patients. It has high clinical application value and is worthy of promotion.

Keywords: Outpatient competency; Internal medicine; Residents; Standardized training; Teaching model

Online publication: May 15, 2026

1. Introduction

Standardized training for resident physicians is a crucial component of the medical education system and a

key step in cultivating qualified clinical doctors. Its core objective is to enhance the clinical competence of resident physicians, enabling them to independently and standardly carry out clinical diagnosis and treatment [1]. As a fundamental pillar of clinical medicine, internal medicine encompasses a wide variety of diseases with complex and ever-changing conditions. Outpatient clinics, as the primary setting for the diagnosis and treatment of internal medicine diseases, undertake vital functions such as disease screening, diagnosis, treatment, and health guidance [2]. Therefore, outpatient competence has become one of the essential core competencies for internal medicine resident physicians, directly relating to their clinical diagnostic and therapeutic skills and the quality of medical services they provide. Currently, there are still many deficiencies in the standardized training teaching model for internal medicine resident physicians in China. Traditional teaching models primarily focus on theoretical instruction and inpatient ward practice, with insufficient emphasis on outpatient practice, resulting in a lack of relevant skill training for resident physicians in outpatient settings [3]. Some standardized training bases lack a systematic outpatient competence training system, with fragmented teaching content and monotonous teaching methods that struggle to meet the needs of resident physicians for outpatient clinical practice. Additionally, due to the high volume of outpatient patients and tight diagnosis and treatment schedules, teaching physicians often find it challenging to balance clinical work with teaching guidance, further affecting the quality of outpatient teaching [4]. The aforementioned issues result in some internal medicine resident physicians still struggling to independently diagnose and treat common outpatient diseases after completing their standardized training, indicating that their outpatient competence needs further improvement. Based on this, this study combines the characteristics of outpatient diagnosis and treatment in internal medicine with the requirements for standardized training of resident physicians to construct a standardized training teaching model for internal medicine resident physicians based on "outpatient competency." By optimizing teaching content, innovating teaching methods, and improving the assessment and evaluation system, the study aims to strengthen the training of outpatient-related skills for resident physicians, enhance their outpatient competency and overall clinical abilities, and provide references for the reform of standardized training teaching in internal medicine resident physicians. The research results are reported as follows.

2. Materials and methods

2.1. General information

Fifty resident physicians undergoing standardized training in internal medicine at our hospital from January 2025 to December 2025 were selected as the study subjects. Inclusion criteria: (1) Meeting the relevant requirements for standardized training of resident physicians and successfully entering the internal medicine training phase; (2) Having a training duration of ≥1 year and fully participating in the teaching model designed in this study; (3) Volunteering to participate in this study and signing an informed consent form. Exclusion criteria: (1) Those who were unable to fully participate in teaching and assessment due to leave, rotation to other departments, or other reasons during the training period; (2) Those with severe communication barriers or mental illnesses. Among the 50 study subjects, there were 18 males and 32 females, aged between 23 and 28 years, with an average age of 25.36 ± 1.24 years. Regarding educational background, 45 held bachelor's degrees and 5 held master's degrees.

2.2. Construction of the teaching model

Centered on the cultivation of "outpatient competency," and integrating the diagnostic and treatment processes in internal medicine outpatient settings with the core competency requirements, we have constructed a "three-dimensional integrated" teaching model. This model encompasses the integration of three dimensions: "theoretical foundation, practical skills, and comprehensive qualities," while advancing in unison through "classroom teaching, outpatient practice, and simulation training." The specific components of this model are outlined as follows.

2.2.1. Clarifying the objectives of outpatient competency cultivation

Drawing on the "Content and Standards for Standardized Training of Residents (Internal Medicine)" and relevant literature [5,6], and considering the actual needs of internal medicine outpatient diagnosis and treatment, we have defined the objectives for outpatient competency cultivation as follows: (1) Professional competence: The ability to independently perform history taking and physical examinations for common outpatient diseases, accurately interpret common auxiliary examination results such as blood tests, urine tests, liver function tests, renal function tests, electrocardiograms, and chest CT scans, and formulate reasonable diagnostic and differential diagnostic plans as well as treatment strategies; (2) Communication skills: The ability to communicate effectively and smoothly with patients and their families, accurately obtain medical history information, patiently answer patients' questions, and establish a good doctor-patient relationship; (3) Professional qualities: Possessing rigorous clinical thinking, a high sense of responsibility, and a good awareness of medical service, strictly adhering to core medical regulations, and standardizing the writing of outpatient medical records; (4) Emergency response capabilities: The ability to properly handle sudden emergencies in outpatient settings, such as anaphylactic shock, arrhythmias, and acute abdominal pain.

2.2.2. Optimizing the teaching content system

Centered on the objectives of outpatient competency cultivation, we have optimized the teaching content to form a "modular" teaching content system, which is specifically divided into four modules:

(1) Outpatient diagnosis and treatment basic module: This module covers the etiology, pathophysiology, clinical manifestations, diagnostic criteria, key points for differential diagnosis, and treatment principles of common diseases in internal medicine outpatient clinics, such as hypertension, diabetes, coronary heart disease, chronic obstructive pulmonary disease, gastritis, peptic ulcers, etc. It also includes fundamental content such as skills for collecting outpatient medical histories, norms for physical examinations, and requirements for writing outpatient medical records.

(2) Auxiliary examination interpretation module: Focusing on commonly used auxiliary examinations in outpatient settings, this module systematically explains examination principles, indications, contraindications, and methods for interpreting results. It emphasizes training in the clinical application of examination results from blood routine tests, biochemical tests, coagulation function tests, electrocardiograms, chest X-rays/CT scans, abdominal B-ultrasounds, etc., enhancing residents' comprehensive judgment abilities regarding auxiliary examinations.

(3) Doctor-patient communication and humanistic qualities module: This module includes content such as doctor-patient communication skills, prevention of medical disputes, medical ethics, and psychological counseling for patients. Through case analyses and scenario simulations, it cultivates residents' awareness of humanistic care and communication abilities.

(4) Outpatient emergency management module: Focusing on common acute emergencies in outpatient settings, such as acute coronary syndrome, cerebral hemorrhage, anaphylactic shock, hypoglycemic coma, and acute asthma attacks, this module explains emergency management procedures, first aid skills, and referral indications, strengthening residents' emergency response capabilities.

2.2.3. Innovative teaching methods

Employ diversified teaching methods to achieve a profound integration of theory and practice:

(1) Case-based learning (CBL): Select typical outpatient cases, such as atypical angina, diabetic ketoacidosis, autoimmune diseases, etc., to guide residents in conducting discussions centered around the cases, covering medical history taking, physical examination, interpretation of auxiliary examinations, diagnosis, and differential diagnosis, thereby cultivating their clinical thinking abilities. Conduct CBL teaching once a week, selecting one to two cases each time, with the supervising teacher leading the discussion and summarizing key points of diagnosis and treatment.

(2) Scenario simulation teaching: Create simulated outpatient diagnosis and treatment scenarios, replicating common clinical situations (such as receiving and treating patients for first-time patients, managing follow-up visits for chronic disease patients, referring difficult cases, handling doctor-patient conflicts, etc.) and emergency scenarios for sudden acute conditions (such as rescue from anaphylactic shock, emergency treatment for arrhythmias, etc.). Residents will role-play as doctors, while supervising teachers or standardized patients will act as patients for practical training. Conduct scenario simulation teaching twice a month, with supervising teachers providing feedback after each session, pointing out deficiencies and offering improvement suggestions.

(3) Outpatient clinic mentoring: Arrange for residents to follow experienced outpatient clinic supervising teachers for learning. The supervising teachers adopt a progressive mentoring model of "demonstration-imitation-guidance-independent practice." Initially, the supervising teacher demonstrates the diagnosis and treatment process and operational skills, with residents observing and learning. In the middle phase, residents are allowed to assist in medical history taking, physical examinations, etc., under the guidance and correction of the supervising teacher. In the later phase, under the supervision of the supervising teacher, residents independently receive and treat simple cases, gradually enhancing their independent diagnosis and treatment capabilities. Each resident should spend no less than three days per week in outpatient clinic mentoring.

2.3. Observation indicators

(1) Outpatient competency score: A self-designed outpatient competency assessment scale was used to evaluate 50 residents before and after training. The scale encompassed eight dimensions: history taking, physical examination, interpretation of auxiliary examinations, diagnosis and differential diagnosis, treatment plan formulation, doctor-patient communication, medical record writing, and emergency response. Each dimension was scored from 0 to 10, with a total score ranging from 0 to 80. A higher score indicated stronger outpatient competency. The scale was reviewed and revised by three internal medicine experts, with a Cronbach's α coefficient of 0.92, demonstrating good reliability and validity.

(2) Theoretical assessment score: A closed-book examination was administered to assess theoretical knowledge related to outpatient diagnosis and treatment, with a full score of 100. Assessments were conducted before and after training.

(3) Skills assessment score: Practical skills assessments were conducted to evaluate core outpatient skills, with a full score of 100. Assessments were carried out before and after training.

2.4. Statistical methods

Data analysis was performed using SPSS 27.0 statistical software. Continuous variables were expressed as mean ± standard deviation (SD), and paired *t*-tests were used to compare pre- and post-training data. Categorical variables were expressed as [*n* (%)], and comparisons were made using the χ^2 test. A *P*-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of outpatient competency scores before and after training

After training, the scores for each dimension of outpatient competency and the total scores of the 50 resident physicians were significantly higher than those before training, with statistically significant differences ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of outpatient competency scores of resident physicians before and after training (mean ± SD, points)

Dimension	Before training	After training	*t*-value	*P*-value
History taking	6.23 ± 0.85	8.76 ± 0.52	19.87	<0.001
Physical examination	6.35 ± 0.78	8.82 ± 0.46	20.34	<0.001
Interpretation of auxiliary exams	5.86 ± 0.92	8.53 ± 0.58	18.65	<0.001
Diagnosis & differential diagnosis	5.78 ± 0.89	8.45 ± 0.61	17.98	<0.001
Treatment planning	5.92 ± 0.95	8.61 ± 0.55	18.32	<0.001
Physician-patient communication	6.54 ± 0.82	8.93 ± 0.43	21.05	<0.001
Medical record documentation	6.46 ± 0.76	8.78 ± 0.48	19.76	<0.001
Emergency response	5.63 ± 0.98	8.32 ± 0.65	16.89	<0.001
Total score	48.77 ± 5.23	69.10 ± 2.86	25.67	<0.001

3.2. Comparison of theoretical and practical assessment scores before and after training

After training, the theoretical and practical assessment scores of the 50 resident physicians were significantly higher than those before training, with statistically significant differences ($P < 0.05$). See **Table 2** for details.

Table 2. Comparison of theoretical and practical assessment scores of resident physicians before and after training (mean ± SD, points)

Assessment item	Before training	After training	*t*-value	*P*-value
Theoretical assessment	76.32 ± 5.18	89.63 ± 4.25	15.78	<0.001
Practical skills assessment	78.54 ± 4.67	91.25 ± 3.86	16.92	<0.001

4. Discussion

4.1. Significance of constructing a teaching model based on “outpatient competency”

The outpatient department serves as the frontline for diagnosing and treating internal medicine diseases, and

the outpatient competency of resident physicians directly influences their clinical diagnostic and treatment quality as well as their future career development [7]. Traditional internal medicine residency training models emphasize inpatient practice and theoretical knowledge instruction, lacking systematic training in outpatient practical skills. This results in numerous difficulties for some resident physicians when independently conducting outpatient work, such as incomplete medical history collection, non-standardized physical examinations, inaccurate interpretation of auxiliary examinations, and poor physician-patient communication [8]. Therefore, constructing a standardized training teaching model centered on "outpatient competency" is of great significance for enhancing the overall clinical competence of internal medicine residents. This approach addresses the limitations of traditional teaching models by reinforcing training in outpatient-related skills. The "three-dimensional integrated" teaching model developed in this study aims to cultivate outpatient competency. It achieves a profound integration of theory and practice by optimizing teaching content, innovating teaching methods, and improving the assessment and evaluation system. This model clarifies the dimensions and objectives of outpatient competency development, making teaching more targeted. The modular teaching content system covers the entire outpatient diagnosis and treatment process, ensuring the systematicity and completeness of the teaching content. Diversified teaching methods enhance the interest and effectiveness of teaching, encouraging residents to actively participate in learning [9].

4.2. Analysis of the application effect of the teaching model

The results of this study indicate that the scores for each dimension of outpatient competency and the total score of the 50 residents significantly increased after training compared to before training ($P < 0.05$). This demonstrates that the teaching model effectively enhances the core outpatient competencies of residents. Notably, significant improvements were observed in fundamental skill dimensions such as medical history taking, physical examination, and doctor-patient communication. This is closely related to the model's emphasis on outpatient shadowing and scenario-based simulation training. Through outpatient shadowing, residents can directly learn diagnostic and treatment techniques from senior physicians and accumulate practical experience. Scenario-based simulation training provides residents with a safe practice environment, allowing them to repeatedly practice relevant skills and improve the standardization and proficiency of their operations [10]. After the training, the theoretical assessment scores and skill assessment scores of the resident physicians also improved significantly ($P < 0.05$). This was also attributed to the application of CBL teaching. CBL teaching, guided by typical cases, encouraged resident physicians to integrate theoretical knowledge with clinical practice, fostering their clinical thinking abilities and thereby enhancing their theoretical and skill levels [11].

This study was a single-center, self-controlled before-and-after study with a relatively small sample size (50 cases) and a short study duration (1 year), which may present certain limitations, such as limited generalizability of the results and difficulty in excluding the influence of other factors on teaching effectiveness.

5. Conclusion

In conclusion, the standardized training teaching model for internal medicine resident physicians based on "outpatient competency" effectively enhances the outpatient competency, theoretical knowledge level, and practical skills of resident physicians by clarifying training objectives, optimizing teaching content, innovating teaching methods, and improving the assessment and evaluation system.

Funding

(1) Natural Science Basis Research Plan of Shaanxi Province, China (Grant No. 2024JC-YBQN-0979)
(2) Science and Technology Development Incubation Fund of Shaanxi Provincial People's Hospital, China (Grant No. 2021YJY-38)
(3) Science and Technology Talent Support Plan of Shaanxi Provincial People's Hospital, China (Grant No. 2023JY-21)

Disclosure statement

The authors declare no conflict of interest.

References

[1] Li H, Lan Y, Chen L, et al., 2024, Practical Application Based on the "Content and Standards for Standardized Resident Training (2022 Edition)"—Taking Standardized Resident Training in the Critical Care Medicine Department as an Example. Health Vocational Education, 42(18): 118–121.

[2] Zhao J, Ma N, Liu Y, 2024, Internal Medicine, Hubei Science and Technology Press, 289.

[3] Qi X, 2024, Retrospective Review and Reflections on a Decade of Standardized Resident Training in China. Chinese Postgraduate Medical Education, 8(01): 1–6.

[4] Hu K, Su H, Wang Q, et al., 2021, Evaluation of the Effect of Teaching Clinics in Cardiovascular Internal Medicine on Cultivating Doctor-Patient Communication Skills among Residents. Science Education and Culture Magazine (First Half of the Month), (25): 97–99.

[5] Hu S, Wang J, 2023, Surgery, People's Medical Publishing House, 444.

[6] Mao J, Yang Y, Wang X, et al., 2023, Review of Literature-Based Guidelines/Consensus on Traditional Chinese Medicine Diagnosis and Treatment of Cardiovascular Diseases. Journal of Traditional Chinese Medicine, 64(07): 649–654.

[7] Xie Q, Guo Y, Peng J, 2023, Exploration and Application of a Hierarchical and Progressive Training Model for Standardized Resident Training in Internal Medicine. China Continuing Medical Education, 15(06): 177–180.

[8] Wang H, Zhang H, Ha Y, 2025, Research on the Current Situation of the Standardized Training System for Resident Doctors in China. China Health Industry, 22(05): 243–245 + 249.

[9] Chen Q, 2022, A Comparative Study on the Training Quality of Two Types of Graduate Students in Clinical Medicine Professional Degrees, dissertation, Fujian Medical University.

[10] Li R, Liu P, Wu L, et al., 2022, Research on the Clinical Competence Training Model for Medical Students under the Background of Medical Education Collaboration. Hunan Journal of Traditional Chinese Medicine, 38(05): 92–95.

[11] Miao Y, 2025, The Application of a Clinical Case-Oriented Management Model in the Public Health Department and Its Impact on Professional Competence Enhancement. China Health Industry, 22(15): 85–88.