Effect Analysis of Continuing Training After Standardized Residency on General Practitioners' Job Competency: Postprint

Authors: Li Yiming

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Abstract

Background: As China' s medical and healthcare system reform continues to deepen, training general practitioners with high-level clinical skills has become particularly urgent. How to continuously improve the clinical skills of general practitioners has become one of the key factors determining the success of tiered diagnosis and treatment and China' s medical reform.

Objective: To investigate the effectiveness of implementing "post-residency retraining" in enhancing the job competency of general practitioners.

Methods: Twenty-four general practitioners who had completed the "Shanghai Standardized Residency Training for General Practice" were selected for retraining in general practice clinical skills. The improvement in comprehensive clinical skills was analyzed before and after the training.

Results: After the retraining, the 24 general practitioners demonstrated significant improvement in five aspects of the comprehensive assessment: "basic emergency skills," "doctor-patient communication," "case analysis," "comprehensive knowledge," and "ECG and X-ray interpretation," with statistically significant differences compared to pre-training levels ($P<0.05$).

Conclusion: Implementing "post-residency retraining" has a significant effect on improving the clinical skills of general practitioners, enhances their job competency, and improves community healthcare service capabilities.

Full Text

Analysis of the Effect of "Post-Standardized Training Re-training" on the Competency of General Practitioners

Authors: LI Yi-ming[1], HUANG Jiao-ling[2], YUAN Xiao-yan[1], GUO Dong-feng[1]
Affiliations: 1. Gongli Hospital of Shanghai Pudong New Area, Shanghai 200135, China; 2. School of Public Health, Shanghai Jiao Tong University School of Medicine, Shanghai 200025, China
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Corresponding Author: GUO Dong-feng, MD, Chief Physician; E-mail: glyyqkjys@163.com

Abstract

Background: As China' s medical and healthcare system reform continues to deepen, cultivating general practitioners (GPs) with proficient clinical skills has become particularly urgent. Continuously improving GPs' clinical competencies represents a key factor for the success of tiered healthcare delivery and broader medical reform in China. **Objective:** To evaluate the effectiveness of implementing "post-standardized training re-training" on improving GPs' job competency. **Methods:** Twenty-four GPs who had completed the "Shanghai Standardized Residency Training for General Practitioners" program were selected for re-training in general practice clinical skills. Improvements in comprehensive clinical competencies were analyzed before and after the training intervention. **Results:** Following re-training, the 24 GPs demonstrated significant improvements across five assessment domains compared to pre-training levels: basic emergency skills, doctor-patient communication, case analysis, comprehensive knowledge, and ECG/X-ray interpretation ($P < 0.05$). **Conclusion:** Implementing "post-standardized training re-training" significantly enhances GPs' clinical skills, strengthens job competency, and improves community healthcare service delivery capabilities.

Keywords: general practitioner; competency; training

Introduction

In 1973, Harvard University professor David McClelland first introduced the concept of "competency." Subsequently, in 1999, the Accreditation Council for Graduate Medical Education defined clinical competency as comprising six core competencies for residents: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice [1]. The Royal College of Physicians and

Surgeons of Canada proposed a competency framework for medical specialists encompassing seven roles: medical expert, communicator, collaborator, manager, health advocate, scholar, and professional [2]. While China has made progress in GP education and training, a gap persists between training content and actual job requirements, resulting in a shortage of GPs with excellent job competency. Accelerating the cultivation of qualified GPs for primary care has become a bottleneck issue for deepening medical reform and advancing Healthy China initiatives [3]. Furthermore, as tiered healthcare systems and family doctor contract services expand, the volume and complexity of patients and diseases at primary care institutions continue to increase, imposing higher demands on the primary care workforce [4]. GP training must emphasize not only common disease management but also clinical reasoning, risk identification, emergency response, humanistic communication, and learning capabilities [5]. Research indicates that community medical personnel in some regions of China demonstrate only approximately 35% pass rates in first aid knowledge assessments such as cardiopulmonary resuscitation [6]. To improve the quality of general practice services at primary hospitals and enhance GP job competency, this study implemented and evaluated a "post-standardized training re-training" program for GPs.

Methods

Study Design and Participants

From January 2016 to December 2018, 24 GPs were randomly selected from eight community health centers within the Shanghai Jinqiao Medical Consortium. All participants had completed the "Shanghai Standardized Residency Training for General Practitioners"(including GP transition training) and passed the exit examination. The cohort comprised 9 males and 15 females with a mean age of 31.67 ± 2.85 years; 17 held bachelor's degrees and 7 held master's degrees or higher .

Training Methods

Participants underwent a six-month re-training program with the following components:

Theoretical Learning Annual theoretical training sessions were conducted from 2016 to 2018, covering four curriculum series: medical humanities, ECG and imaging interpretation, clinical reasoning development in general practice, and management principles for acute and severe conditions in common community diseases.

Clinical Competency Training This combined supervised teaching with self-directed learning, integrating demonstration and practice, led by associate chief physicians or higher-level instructors. The program emphasized clinical

reasoning training, chronic disease prevention, and continuous care management. Training was conducted in groups of four, with each GP completing six months of specialized training: four months in general practice wards and two months in general practice outpatient clinics.

General Practice Ward Teaching Rounds: These emphasized guidance on patient lifestyle, psychological factors, and family environment. While focusing on chronic diseases, the training stressed referral processes and pre-referral management. Rather than single-disease approaches, the program strengthened interdisciplinary connections to help GPs integrate knowledge across specialties and expand clinical reasoning.

General Practice Outpatient Demonstration Teaching: This enhanced outpatient instruction, standardized diagnostic techniques, and cultivated general practice diagnostic thinking, with particular emphasis on doctor-patient communication, identification of acute and critical conditions, and referral decisions to comprehensively improve GP consultation capabilities.

Basic Clinical Skills Training: This component strengthened fundamental clinical skills, particularly basic emergency skills such as cardiopulmonary resuscitation, emphasizing procedural standardization and effectiveness.

Assessment Methods

Objective Structured Clinical Examination (OSCE): Participants underwent comprehensive assessment before and after re-training using OSCE, which evaluated eight domains: comprehensive theoretical knowledge, ECG and X-ray interpretation, history taking, physical examination, medical record writing, case analysis, basic emergency skills, and doctor-patient communication. The assessment integrated clinical reasoning, practical skills, and theoretical knowledge. Comprehensive theoretical knowledge and ECG/X-ray interpretation were tested via computer-based examination, while other domains employed a dual-examiner scoring system. All examiners held "Shanghai Standardized Residency Training Examiner" qualifications.

Statistical Analysis

SPSS 22.0 software was used for statistical analysis. Measurement data were expressed as mean ± standard deviation. Paired t-tests were used for pre-post comparisons within groups, and independent t-tests for between-group comparisons. $P < 0.05$ was considered statistically significant.

Results

Assessment Score Analysis

Following re-training, GPs demonstrated improved scores across all assessment domains. Five domains showed statistically significant improvements ($P < 0.05$):

basic emergency skills, doctor-patient communication, case analysis, comprehensive knowledge, and ECG/X-ray interpretation .

Pass and Excellence Rate Analysis

Using the grading standard of 80-100 as excellent, 60-79 as pass, and below 60 as fail, the proportion of participants achieving pass or excellent was calculated as the pass rate. Results indicated 100% pass rates across all domains post-training, with improved excellence rates in all domains except comprehensive theoretical knowledge .

Domain-Specific Analysis

Basic Emergency Skills: Participants already demonstrated high baseline competency (95.8% pass rate) after completing standardized residency training. The targeted re-training further improved operational quality, with mean scores reaching 84.35 and excellence rates substantially increased, elevating performance from "able to perform" to "proficient execution."

Case Analysis: This domain comprehensively reflects GP clinical reasoning. Mean scores increased from 58.36 pre-training to 65.47 post-training, with significant improvements in both pass and excellence rates. Clinical reasoning is crucial for GPs, and the re-training program' s teaching rounds, outpatient demonstrations, and clinical reasoning curriculum substantially enhanced case analysis capabilities and logical thinking.

Doctor-Patient Communication: Given the demands and characteristics of general practice, establishing strong doctor-patient relationships requires exceptional communication skills. Re-training significantly improved this competency through medical humanities courses in the theoretical curriculum and integration of humanistic principles across all clinical training components, fostering empathy and emphasizing guidance on patient lifestyle and psychological factors.

Comprehensive Theoretical Knowledge: Assessment difficulty and scope were equivalent to standardized residency exit examinations, which all participants had previously passed. However, after entering community practice, GPs generally neglected ongoing theoretical learning, resulting in a pre-training pass rate of only 50%. Re-training increased this to 100%, demonstrating remarkable effectiveness. However, few participants achieved excellence, confirming that theoretical knowledge remains a relative weakness for GPs.

ECG and X-Ray Interpretation: This domain reflects the clinical application of fundamental knowledge. Re-training improved overall proficiency, particularly in recognizing characteristic findings of common diseases. However, identification of atypical images requires further improvement to reach excellence.

Physical Examination, History Taking, and Medical Record Writing: Improvements in these domains were not statistically significant. Their common characteristic was high pre-training pass and excellence rates, reflecting the strong foundational capabilities of GPs in the Shanghai Jinqiao Medical Consortium.

Discussion

This study demonstrates that post-standardized training re-training for GPs yields significant effectiveness. Statistical analysis of pre- and post-training skill assessments reveals substantial improvements in basic emergency skills, doctor-patient communication, case analysis, comprehensive knowledge, and ECG/X-ray interpretation.

The study also found that GPs returning for training after community practice demonstrated higher learning motivation and greater efficiency in short-term targeted training, while avoiding work-study conflicts. Unlike conventional advanced training, this re-training program emphasized a care philosophy of "people-oriented, goodness-rooted; skill-based treatment, virtue-based persuasion." The curriculum better aligned with community clinical work needs, focusing on solving fundamental clinical problems, cultivating clinical reasoning, emphasizing effective emergency operations, and integrating humanistic cultivation. Addressing the problem of fragmented disciplinary knowledge, the program integrated content across specialties into a cohesive whole, enabling scientific analysis and improving comprehensive application abilities [7].

Fundamental theory remains a weak link in GP competency. We recommend that GPs continuously strengthen theoretical learning, regularly participate in continuing medical education, and subjectively recognize the importance of life-long learning.

In summary, this post-standardized training re-training program demonstrates high practical value and application potential. The convenient and replicable methodology not only addresses the disconnect between specialty rotation-based residency training and actual GP work but also compensates for insufficient cultivation of general practice clinical thinking [8]. The program enhances GPs' clinical competency for community practice and can be further promoted to enable more GPs to participate in re-training, ensuring that community residents receive more effective, accurate, and systematic diagnosis and treatment, thereby creating a stronger foundation for China' s primary healthcare security system.

Author Contributions: GUO Dong-feng was responsible for project design and conceptualization; LI Yi-ming implemented the study, collected and organized data, performed statistical analysis, and drafted the manuscript; HUANG Jiao-ling was responsible for quality control and manuscript review; YUAN Xiao-yan supervised the project. The authors declare no conflicts of interest.

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