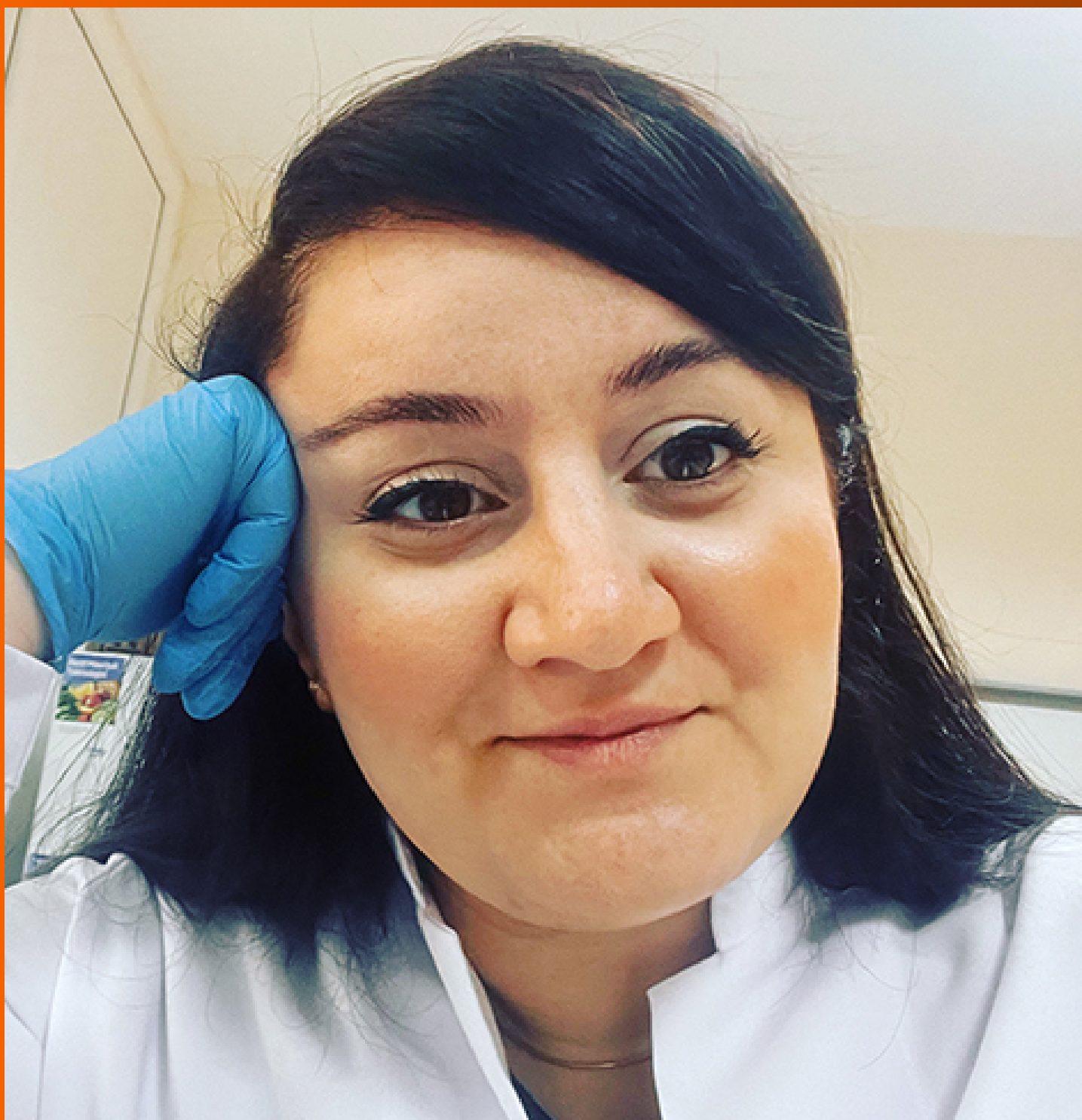


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## Post competency training in standardized training of resident physicians and integrated postgraduates

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### Abstract

We focus on the importance and necessity of post-competency-based training in medical education alongside its current challenges and opportunities. Integrating post competency training into standardized educational frameworks is increasingly recognized as a critical component of preparing residents and postgraduates for real-world clinical practice. Post competency training represents a commitment to excellence in medical education, striving to produce competent, skilled practitioners to meet the challenges of modern healthcare.

**Key Words:** Post competency; Standardized training; Resident; Postgraduate; Competency-based medical education

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**Core Tip:** Competency-based medical education (CBME) represents the current major transformation in global medical education and training. This transformation involves ongoing updates to training programs, pedagogical methods, assessment frameworks, resource allocation, and educational management. Integrating post competency training into standardized training frameworks is increasingly recognized as a critical component of preparing residents and postgraduates for real-world clinical practice. Looking ahead, applying CBME in the standardized training of residents and postgraduates promises to deliver professionals with the competencies needed for present and future medical challenges.

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## INTRODUCTION

The earliest concept of competency was introduced by renowned psychologist David McClelland at Harvard University in 1973, and it was characterized as the fundamental traits that set individuals apart with outstanding performance from their counterparts within a particular occupation[1]. In 2010, the International Association for Medical Education introduced a report in *The Lancet* that spotlighted a global shift towards an educational model based on competencies, marking the third generation of reforms and emphasizing clinical capabilities as the core of healthcare training[2]. Post competency, also known as job competency or position competency, refers to the sum of knowledge, skills, abilities and characteristics that indicate that an employee is capable of excellent working performance in a specific organization. Notably, post competency does not equate to, or is limited to medical knowledge, clinical skills, and professionalism. Increasingly emphasizing competency in current health care is crucial for enhancing the quality of patient care, ensuring patient safety, keeping up to date with medical advances, fostering effective teamwork, and meeting regulatory and accreditation standards[3,4]. This focus on competency helps to guarantee that healthcare professionals are equipped with the necessary knowledge, skills, and attributes to perform their roles proficiently and deliver superior health services.

We are interested in the original article by Sun *et al*[5]. We consider this a qualified and enlightening study, as the authors presented the construction of a position-competency-based clinical research nurses (CRN) training program designed to bridge the gap between the available number of CRN and clinical projects and verified the scientific and expandable nature of the CRN training program. This article will undoubtedly stimulate medical administrators and medical education researchers to pay more attention to competency-based training, which will help to improve the construction of medical education curriculum, promote a more professional clinical medical practice, help managers to enhance the allocation of medical resources, and improve the quality and satisfaction of mutual medical care service.

## COMPETENCY-BASED MEDICAL EDUCATION

Competency-based medical education (CBME) is a modern approach to medical education with a history of > 60 years, which is being adopted and implemented by increasing numbers of medical institutions globally[6,7]. Research on the post competency of healthcare professionals has risen in recent years; not only because these are critical components in preparing these practitioners for real-world clinical practice, but also due to concerns over the capabilities of future healthcare practitioners in the context of new medical technologies and patient needs, which is a demand of the continuous evolution of modern medical education and training[8,9].

The importance and necessity of competency-based medical training lie in its ability to ensure that healthcare professionals are consistently prepared to meet the evolving demands of clinical practice, clinical research, patient care, and the dynamic healthcare environment[5,10]. This approach to education helps standardize the level of skill and knowledge among medical practitioners, which is crucial for maintaining consistent quality of healthcare across different settings and specialties. It also supports lifelong learning by encouraging continuous improvement and adaptability to the latest medical advancements and best practices, increasing job satisfaction and reducing attrition rates among healthcare professionals[11,12]. CBME mitigates undergraduate students' anxiety and addresses the needs of an increasingly diverse patient population and the complexities of modern healthcare systems[13].

The demand for and implementation of medical practitioners' competencies can vary across countries, primarily due to variations in healthcare systems, cultural contexts, educational frameworks, resource availability, and policy priorities [14]. These factors contribute to the unique environments in which medical professionals are trained and operate, necessitating customized competency standards that align with the nation's health needs and infrastructure.

## STANDARDIZED TRAINING OF RESIDENTS AND POSTGRADUATES

Standardized medical education and training play a critical role across the significant stages of college education, postgraduate education, and continuing education in medicine. Its importance includes enhancing medical personnel's practical abilities and clinical skills, promoting continuous professional development, ensuring patient safety and quality care, and improving the quality of the regional healthcare workforce[15,16]. Post competency is among the most crucial metrics within standardized medical education.

The standardized residency training program is critical to reforms in Chinese health care and higher education. It aims to cultivate health professionals to meet national quality standards and equip them with the clinical, ethical and humanistic competencies necessary to deliver high-quality services. In mainland China, mandatory residency training, which merges standardized programs with competency-based goals, typically spans 3 years for undergraduate and



graduate physicians[17]. The standardized training assessment comprises a dynamic process evaluation that measures attendance, training objective completion, and learning participation, culminating in a graduation examination that evaluates overall effectiveness through practical skills and written tests. According to a study involving 5555 Chinese residents, those who underwent standardized residency training achieved satisfactory training outcomes, with pass rates of 91.8% for practical skills examinations and 96.5% for written exams[18].

## CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING COMPETENCY-BASED MEDICAL TRAINING

Reference citation analysis (RCA, <https://www.referencecitationanalysis.com/>) is a unique artificial intelligence system for citation evaluation of biomedical literature. RCA has been used to analyze previous studies of post competency training in standardized training of residents and postgraduates up to January 2024.

After decades of evolution, scholars have identified certain factors contributing to the suboptimal effectiveness of competency-based medical training. These include lack of accreditation for training institutions, the ambiguity of trainers' roles, vague training programs and assessment methods, time constraints and fatigue due to overwhelming paperwork, a lack of teaching resources and opportunities for independent medical practice, diverse levels of teaching skills among educators, disconnects between trainers and trainees, and varied assessment systems across different countries or regions making it challenging to homogenize the competency-based training process[19-24]. In the wake of greater emphasis on competency-based medical training, incidents have occurred where a lack of proper oversight led to misconduct, such as a trainee doctor faking signatures related to competencies, which resulted in a suspension for 12 mo[25]. Simultaneously, while CBME methods allow for personalized teaching practices to meet the needs of diverse learners, the ongoing refinement and individualization of training programs can also raise concerns about educational equity[26].

Despite many current and potential problems, the emphasis on post competency in medical education and training is an inevitable response to meet the new development needs of the healthcare industry. At the same time, problems are also necessary for development and progress. Medical administrators and education researchers have actively explored post competency-based medical education and training worldwide.

The first point is policy reforms. Against the backdrop of global medical education reform, it is necessary to clearly define and continually develop the concept of medical post competency and establish corresponding accreditation and assessment systems[27,28]. Recognizing that the competencies required for different medical positions can evolve over time is essential. As health care advances and patient needs change, so must medical professionals' competencies. This dynamic nature of post competency means that training programs must be flexible and adaptable to incorporate new knowledge, technologies and practices[29]. Consequently, the frameworks used to assess and certify the competencies of resident physicians and postgraduates must be regularly updated to ensure they remain relevant and effective in equipping medical professionals with the skills necessary for their roles in the current and future healthcare landscape.

The second part is technological innovations. When considering the perspective of residents and postgraduates involved in standardized training, it becomes essential to incorporate emerging technologies and innovative educational methodologies. Such new technologies include artificial intelligence, virtual reality and telemedicine, which can be leveraged to enhance learning experiences and provide more interactive and realistic training scenarios[30]. In terms of novel pedagogical approaches, techniques like micro-videos, flipped classrooms, and critical pathway management can be utilized to engage trainees more effectively, maximize their satisfaction, and improve the overall quality of training[31, 32]. Integrating these advancements into the framework of medical education reform is vital to preparing future healthcare professionals with the necessary competencies to excel in a rapidly changing medical landscape.

Thirdly, from the perspective of administrators in medical education, it is crucial to foster a supportive environment that encourages innovations and embraces changes during the post competency training in residents and postgraduates. It involves not only facilitating the necessary training resources and infrastructure, integrating novel technologies and teaching methods, but also rethinking learners' requirements, curriculum structures, and institutional policies to align with the evolving needs of CBME[33]. Educational initiatives focused on post competency are being experimented with and explored globally[14,34,35]. Institutional support should also extend to professional development opportunities for faculty members to guarantee their necessary knowledge and aptitude to utilize these innovative technologies and pedagogical approaches. Additionally, administrators play a vital role in creating a culture of continuous improvement within medical education and training. They should advocate for ongoing evaluation and feedback mechanisms that allow for assessing educational outcomes and identifying areas for enhancement. By establishing a climate that values feedback and competency-based practice, administrators can drive the evolution of medical education and training to meet the dynamic demands of healthcare service. In summary, administrators of medical education institutions have a pivotal role in championing the integration of new technologies and methodologies, fostering an environment of innovation, and ensuring that CBME remains adaptable and responsive to the needs of the ever-evolving healthcare service.

Considering the challenges and opportunities presented within the aforementioned competency-based standardized training in health care, it becomes evident that a proactive and adaptive approach is essential. The future development of CBME may need to focus on the following aspects, including establishing a robust system of accreditation and certification that aligns with the new competency-based framework, integrating alternative educational pathways without compromising the quality of training or the integrity of the competency assessments, exploring to interface the regional education structure with the global approach to CBME, and continuously improving with innovation opportunities and techniques[36].

## CONCLUSION

CBME represents the current major transformation in global medical education and training, with its future hinging on adaptability to the dynamic healthcare environment. This transformation involves ongoing updates to training programs, pedagogical methods, assessment frameworks, resource allocation, and educational management. Looking ahead, applying CBME in the standardized training of residents and postgraduates promises to deliver professionals with the competencies needed for present and future medical challenges.

## FOOTNOTES

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