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Using Entrustable Professional Activity Scores for Ward Round Performance Assessment of Internists in Internal Medicine: A Comparative Study of Two Medical Training Models

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Abstract

Background: The shift to competency-based medical education stresses Entrustable Professional Activities (EPAs) as a framework for assessing trainees' competence for autonomous practice via specific professional tasks. This study examined the effectiveness of two training programs for acquiring internal medicine competencies: the conventional model and the Collaborative Project to Increase Rural Doctor Production (CPIRD) in a rural teaching hospital.

Methods: A comparative study of 88 first-year internal medicine interns (64 conventional, 24 CPIRD) was conducted at Sakon Nakhon Hospital, Thailand. EPA assessments were based on Thai Medical Council criteria and scored on a five-level scale. Statistical analyses were performed to compare group differences in EPA performance.

Results: Total EPA scores were similar between the conventional (4.42±0.498) and CPIRD (4.46±0.509) groups (P = 0.381). The conventional group performed better in EPA 3 (Differential diagnosis) and EPA 5 (Prescribe management) (P = 0.036, P = 0.034), while the CPIRD group excelled in EPA 6 (Basic procedural skills). No significant demographic factors influenced above-average EPA scores.

Conclusion: Both training models effectively develop overall competency in internal medicine. Differences in specific EPAs suggest that rural-based training enhances procedural skills, while conventional training strengthens diagnostic and management abilities. Tailored curricula could further optimize training outcomes.

Introduction

In Thailand, medical student recruitment and training have traditionally followed a conventional approach known as the "normal track," which is regulated by the Ministry of Higher Education, Science, Research, and Innovation.[1] Students are admitted to medical school based on academic performance in national exams (Thai University Central Admission System). These students complete a six-year medical program, which includes three years of preclinical education and three years of clinical training. To become physicians, graduates must pass extensive exams as well as the national licensure examination. Normal track graduates are obligated to service for three years and frequently choose their workplace based on vacancy availability.[2] Despite attempts to boost medical graduates and reduce healthcare disparities, Thailand continues to have shortages, particularly in rural areas. To address this issue, the Collaborative Project to Increase Rural Doctor Production (CPIRD) was formed, which focuses physician deployment in rural areas.[3,4] This project recruited students from remote areas and provided training with the goal of generating doctors who are devoted to aiding underserved populations. The project's goal was to increase the number of rural doctors by expanding

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medical school options for students from rural areas. Furthermore, the Ministry of Public Health worked with medical schools to establish and implement the initiative in order to train doctors in accordance with health-care system demands and to boost staffing capacity in rural hospitals. Each year, roughly 300 candidates were recruited to medical schools, with a focus on rural backgrounds and intellectual achievement.

CPIRD students, like their conventional counterparts, must pass a national licensing exam. After finishing their first year of internship at a teaching hospital, all graduates work two years in rural hospitals to solve physician shortages.[5,6]

Medical education has recently transitioned to a competency-based approach that emphasizes trainees' ability to complete specific tasks autonomously in real-world contexts. This strategy focuses on Entrustable Professional Activities (EPAs), which are specific tasks that trainees must complete before being allowed to practice unsupervised.[7,8,9] EPAs have emerged as a paradigm for assessing clinical competency, notably in internal medicine.[10,11] EPAs evaluate not just knowledge and procedural abilities, but also broad competences including communication, teamwork, and professionalism.[12,13,14] This study analyzes the EPA scores of first-year postgraduate internists in internal medicine at a rural teaching hospital, with an emphasis on the standard medical training model versus the CPIRD paradigm. Its goal is to assess the effectiveness of both training programs in developing the abilities required for autonomous practice.

Methods

This was a descriptive cohort study. We conducted a comparative study of first-year postgraduate internists in a rural teaching hospital. A rural medical education program was designed to increase the possibility that qualified medical professionals would stay in rural and distant places. The internists improved their expertise by rotating through different fields inside the training units every 1-3 months. Internal Medicine took 2-3 months, Surgery 2 months, Pediatrics 2 months, Obstetrics and Gynecology 2 months, Orthopedics 1 month, and Emergency Medicine 1 month.

This report was studied specializing in Internal Medicine during a three-month rotation of academic year 2021 and 2023 at Sakon Nakhon Hospital, a rural teaching hospital in Thailand. It used baseline data of age, gender, region and types of graduated medical school.

The study included internists trained under two models:

Group 1: Conventional medical training model (Normal track)

Group 2: CPIRD project training model

The CPIRD model concentrated on student selection based on rural background factors. The students received their training at medical schools and rural hospitals near their hometowns. After graduation, they were required to return to their home provinces. The 6-year program was divided into two parts: students studied preclinical science courses at medical schools for the first three years, and then spent the final three years at regional or provincial rural hospitals. CPIRD doctors were reassigned to their home provinces after graduation. Normal track grads were then given the opportunity to select among the remaining openings. CPIRD graduates, like normal track graduates, were obligated to serve for the Ministry of Public Health for three years following graduation, primarily in rural hospitals. Table 1 provides a description of the conventional and CPIRD models.

Since 2018, workplace-based assessment (WBA) has been conducted in accordance with the Thai Medical Council's (TMC) performance assessment form. In this study, EPA categories were used to assess competencies (Table 2), with scores assigned across five levels (Table 3). Data was gathered through systematic clinical evaluations, examination of patient records, performance in patient simulations, and observation of interviews with experience assessment personnel.

(1) Internal medicine specialists who were in charge of training physicians to work in accordance with departmental standards.

(2) The department head and medical experts from other medical specialties who assessed internists' performance.
(3) Internal Medicine Residents.
Statistical Analysis

Continuous variables were presented as mean ± standard deviation, and categorical variables as percentages or proportions. The student's t-test and Mann-Whitney test were used to compare groups. For categorical variables, the Pearson χ^2 test was applied. Logistic regression examined predictors of achieving above-average scores (≥4). Data was analyzed using Statistics Kingdom® software (Version 2017, Australia), with significance set at $P < 0.05$.

Results

A total of 88 first-year postgraduate internists participated, with 64 from the conventional model and 24 from the CPIRD model. Participants' average ages were 24.44±0.687 years in the traditional group and 24.79±1.693 years in the CPIRD group, with no significant gender dispersion. However, demographic data revealed significant variations in educational backgrounds between the two groups, with 78.1% of traditional trainees graduating from urban medical schools vs none in the CPIRD group. There were also variances in terms of institution type. It was discovered that the traditional group had a higher proportion of students graduating from older institutions. (Table 4) The mean total EPA scores were comparable between groups: 4.42±0.498 for conventional and 4.46±0.509 for CPIRD (P=0.381). However, there were significant differences in two specific EPAs: EPA 3 (Provide proper differential diagnosis) and EPA 5 (Prescribe appropriate management), where the conventional group outperformed the CPIRD group (P=0.036 and P=0.034, respectively). Table 5 contains detailed information about EPA scores. There was no statistical significance found in the analysis of factors impacting the likelihood of reaching above-average total EPAs (scores ≥4). (See Table 6).

Discussion

This study compared the efficiency of Entrustable Professional Activities (EPAs) in the training of postgraduate internal medicine interns to two training approaches: the traditional model and the Collaborative Project to Increase Rural Doctors (CPIRD) initiative. The findings revealed no significant changes in overall EPA scores between the two training groups, implying that both approaches were equally efficient at providing postgraduate interns with the necessary competences. Both cohorts achieved equivalent levels of competency across the examined EPAs, demonstrating the effectiveness of both training methods. However, considerable variances were found in specific EPAs. Interns trained in the conventional model performed better in EPA 3 (Providing proper differential diagnosis and diagnosis) and EPA 5 (Prescribing appropriate management), although the CPIRD group seemed to do better in EPA 6 (Performing fundamental procedural skills). These distinctions were most likely due to the different emphases of the training programs. Moreover, there were no significant factors affecting the likelihood of getting an above-average overall EPA score (≥ 4).

Ward rounds, an important component of both hospital operations and medical education, pose significant problems for clinicians and educators.[15,16] Recent study has highlighted their importance and the need for formal evaluation systems. Schmelter et al.[17] proposed an observation checklist to assess performance during internal medicine ward rounds, which was created and validated using focus group discussions and video analysis. This checklist, which included nine skills, 25 activities, and 110 observable behaviors, had strong interrater reliability, although additional validation across institutions was advised. Nørgaard et al.[18] examined the necessary competences for efficient ward rounds. Based on a thorough examination of the literature and expert interviews, the study identified nine essential competency domains, including communication, collaborative clinical reasoning, and organizing. Over 70% of specialists stressed the importance of communication and teamwork, as well as self-management and mistake management, emphasizing the necessity to include these skills into medical curricula.

The majority of studies assessing internal medicine performance focused on improving EPAs. Dehghani et al.[19] conducted a systematic review of various EPAs in internal medicine and classified them into six

domains: care and management of the general adult population, care for patients with special needs, care coordination and communication, management and leadership, healthcare quality, education and research, and others. These areas were then separated into 14 themes and 24 sub-themes, resulting in a sophisticated framework for understanding trainee competencies. Hauer et al.[20] assessed the pilot use of two EPAs (Discharge and Family Meeting) in an internal medicine training program. The discharge EPA received favorable feedback, with participants seeing it as beneficial for competency-based evaluation. However, opinion on the family meeting EPA was mixed, indicating that it need additional refining to improve its utility and sustainability. Chan et al.[21] demonstrated a collaborative approach to building an EPA for transitions of care that included both residents and professors. The approach of carefully ranking 142 developmental milestones was enhanced to determine the 15 most critical milestones for care transfers. The study revealed the viability of constructing EPAs using a structured but flexible consensus-building process. lmutar et al.[22] examined medical students' perceptions of ward rounds in medical and surgical settings at Kuwait University. The study discovered that students' present competency scores were significantly lower than their expectations ($P < 0.001$), with bedside examination evaluated as the best-taught skill. Medical ward rounds were found to be more effective in training professional attitudes and patient interactions than surgical rounds ($P < 0.001$).

Overall, the lack of substantial variations in EPA performance between the conventional and CPIRD training models implies that both methods are effective in producing competency-based educational results. These findings support the continued use of both training paths, emphasizing the versatility of EPA-based assessments across a variety of training situations. However, the observed disparities across EPAs highlight the significance of adapting training programs to specific areas for growth. The higher EPA 6 scores for the CPIRD group show that rural-based training may provide more practical procedural experience, which is an important factor to consider in other training models. In contrast, the CPIRD group's inferior performance in EPA 3 and EPA 5 may highlight areas that require more effort and resources. Recognizing these discrepancies can help influence the development of curricula and training initiatives for both traditional and rural-based programs, resulting in better overall educational outcomes.

This study's cross-sectional design limits its ability to provide a comprehensive picture of EPA performance. Longitudinal investigations are required to monitor the progression of clinical competence across time. Furthermore, the study's single-center design may limit generalizability. Future study should look at the underlying causes of variances in EPA scores, as well as the effectiveness of EPA-based training in varied healthcare settings. By identifying these areas for improvement, training schools can tailor their curricula to better educate internists for the challenges of clinical practice, thereby improving patient care in both urban and rural healthcare settings.

Limitation

Several limitations should be noted in this study. Firstly, the study's cross-sectional design provides a snapshot of EPA performance rather than a longitudinal view of competency development over time. Longitudinal studies would provide more insight into how EPA performance evolves throughout the training period. Additionally, the study was conducted in a single rural teaching hospital in Thailand, which may limit the generalizability of the findings to other settings or countries with different healthcare and training contexts.

Conclusion

In conclusion, this study shows that both conventional and CPIRD training programs produce competent internists, as shown by comparable total EPA ratings. The found discrepancies between specific EPAs indicate the need for focused training program modifications. By using these insights, medical education stakeholders may better customize their programs to address the observed strengths and deficiencies, thereby increasing training and patient care quality.

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Table 1 Description of the conventional and CPIRD training model of Thai medical doctors

Description	Normal track	CPIRD
Students	Secondary school students from any areas in Thailand	Secondary school students from rural provinces
Examination for recruitment	National entrance examination and regional-level university recruitment	Separate recruitment and examinations for each collaborating center between universities and rural teaching hospitals
Preclinical training	20 universities	15 universities
Student financial support for medical training	None	None
Obligation to work for the government medical services	Yes	Yes
Job placement	Government hospitals, both outside and inside the Ministry of Public Health	Rural hospitals in their home provinces and districts
Duration of mandatory service	3 years	3 years

Table 2 Entrustable Professional Activities (EPAs) categories of internal medicine

EPA	Category
1	Gather proper information
2	Request & interpret investigations
3	Provide proper differential diagnosis & diagnosis
4	Recognize & manage deteriorating or acutely unwell patients, know limitation & timing to consult
5	Prescribe appropriate management
6	Perform basic procedural skills for diagnosis/treatment
7	Handover & discharge patient care
8	Inform & counsel patient & family
9	Communicate & teamwork with colleagues
10	Suggest proper prevention & health promotion plan
11	Record proper and adequate clinical information

Table 3 Entrustable Professional Activity (EPA) scales

Scale	Details
1	Invaluable

2	Below average
3	Average
4	Above average
5	Outstanding

Table 4 Demographic characteristics of internists

Characteristics	Conventional model N=64 (%)	CPIRD model N=24 (%)	*P*-value
Age (Mean ± SD)	24.44±0.687	24.79±1.693	
Gender			0.50993
Male	29(45.3)	9(37.5)	
Female	35(54.7)	15(62.5)	
Region of graduated medical school			< 0.00001*
Metropolitan area	50(78.1)	0(0)	
Out-country area	14(21.9)	24(100)	
North	1(1.6)	3(12.5)	
Northeast	2(3.2)	21(87.5)	
Central	10(15.6)	0(0)	
South	1(1.6)	0(0)	
Others	1(1.6)	0(0)	
Types of graduated medical school			0.000296*
Old institution (≥20 years)	61(95.3)	16(66.7)	
New institution (<20 years)	3(4.7)	8(33.3)	

*Statistical significance (*P*<0.05)

Table 5 Mean scores of assessment in different groups

EPAs	Conventional model (Mean ± SD)	CPIRD model (Mean ± SD)	*P*-value
EPA 1	4.62±0.238	4.46±0.509	0.081
EPA 2	4.64±0.234	4.54±0.509	0.201
EPA 3	4.64±0.515	4.42±0.504	0.036*
EPA 4	4.67±0.473	4.63±0.495	0.342
EPA 5	4.67±0.473	4.46±0.509	0.034*
EPA 6	4.73±0.445	4.75±0.442	0.442
EPA 7	4.67±0.473	4.63±0.495	0.342
EPA 8	4.61±0.492	4.67±0.482	0.313
EPA 9	4.76±0.427	4.67±0.482	0.176
EPA 10	4.56±0.500	4.50±0.511	0.302
EPA 11	4.67±0.473	4.54±0.509	0.132
Total	4.42±0.498	4.46±0.509	0.381

*Statistical significance (*P*<0.05)

Table 6 Factors affect above average level of total EPA scores (scores ≥4)

Factors	Odd ratio	95% Confident interval	*P*-value
Male gender	2.1667	0.8983-5.2260	0.0852

Female gender	0.4615	0.1914-1.1132	
Old institution (≥20 years)	1.7806	0.4995-6.3483	0.3737
New institution (<20 years)	0.5616	0.1575-2.0022	
Metropolitan medical school	2.1569	0.9083-5.1215	0.0815
Rural medical school	0.4636	0.1953-1.1109	
Conventional model	1.9697	0.7624-5.0886	0.1616
CPIRD model	0.5077	0.1965-1.3116	

*Statistical significance (P<0.05)