Can We Predict Final Outcome of Internal Medicine Residents with In-Training Evaluation

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Objective: *To assess the predictive value of in-training evaluation for determining future success in the internal medicine board certifying examination.*

Material and Method: *Ninety-seven internal medicine residents from Faculty of Medicine Siriraj Hospital who undertake the Thai Board examination during the academic year 2006-2008 were enrolled. Correlation between the scores during internal medicine rotation and final scores in board examination were then examined.*

Results: *Significant positive linear correlation was found between scores from both written and clinical parts of board certifying examination and scores from the first-year summative written and clinical examinations and also the second-year formative written examination ($r = 0.43$-0.68, $p < 0.001$). Monthly evaluation by attending staffs was less well correlated ($r = 0.29$-0.36) and the evaluation by nurses or medical students demonstrated inverse relationship ($r = -0.2$, $p = 0.27$ and $r = -0.13$, $p = 0.48$).*

Conclusion: *Some methods of in-training evaluation can predict successful outcome of board certifying examination. Multisource assessments cannot well extrapolate some aspects of professional competences and qualities.*

Keywords: *Internal medicine, Board certifying examination, In-training evaluation*

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An internal medicine residency training program in Thailand and in Faculty of Medicine Siriraj Hospital has been established since 1970 under the supervision of the Medical Council of Thailand and later also under the Royal College of Physicians of Thailand (RCPT). After being admitted for training, internal medicine residents must pass both written and clinical parts of the RCPT board certifying examination. If they fail in one part, they can be reexamined only in that part for achieving a diploma.

During the 3-year training period of practice-based learning, trainees must pass all the aspects evaluated during each rotation and each academic year. Currently, the in-training evaluation consists of:

1. Monthly evaluation from attending staffs, medical students, and nursing staffs.
2. Institutional summative evaluation with both written and clinical examinations at the end of first-year training.
3. RCPT formative evaluation with written examination after 6 months of second-year training.
4. Clinical competence log book.

Our earlier study demonstrated the modest correlation between scores from written and clinical parts of RCPT board certifying examination and also the modest reliability and validity of long case and short case which attribute the major sections of clinical examination[1,2]. In this study, we aim to evaluate the correlation between scores from in-training evaluation and from the written and clinical examinations of the RCPT board certifying examination.

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Material and Method

The RCPT board certifying examination was developed to evaluate a wider scope of clinical

competence; it consists of the written examination with multiple choice questions given at the end of the second-year training, followed by the clinical examination (long case, short case and laboratory interpretation) in the middle and at the end of the third-year training. Between the academic years 2006 and 2008, data from internal medicine residents of Faculty of Medicine Siriraj Hospital who entered the written and clinical parts of RCPT board certifying examination were collected. For each candidate, background scores from in-training evaluation were also retrieved. Correlation was assessed by Pearson's correlation coefficient with the level of significant at p-value < 0.05 using statistical software SPSS version 13.0 (SPSS Inc, Chicago, USA).

Results

There were 97 internal medicine residents during the study period. The detail of scores from various sources during in-training evaluation and RCPT board certifying examination are presented in Table 1. For the monthly attending staffs evaluation, the average scores increased gradually in advanced of training year. The average scores from nursing staffs and medical students evaluation were higher than that given by attending staffs.

When scores from in-training evaluation were examined for their relationship with scores from written part of board certifying examination as in Table 2. The monthly evaluation by attending staffs in each year had fair correlation, but were not for those derived from nurses and medical students. The written and clinical examinations during training had a moderate to good degree of relationship with the final theory assessment from board certifying examination. These phenomena was also observed in the clinical part of RCPT board certifying examination with a slight lesser degree of correlation (Table 3).

Discussion

Competence comprises knowledge, skills and attitudes. Specifically, Miller classified competence into

Table 1. Mean and standard deviation (SD) of scores from in-training evaluation and RCPT board certifying examination

Scores	Mean (%)	SD
In-training evaluation		
First-year monthly attending staff evaluation	79	5.7
Second-year monthly attending staff evaluation	83.9	4.7
Third-year monthly attending staff evaluation	85.8	3.5
First-year summative written examination	49.7	7.7
First-year summative clinical examination	67.1	5.4
Second-year RCPT formative written examination	54.8	10.4
Nursing staff evaluation	86.9	2.3
Medical students evaluation	96.0	4.5
RCPT board certifying examination		
Written part	61.9	7.3
Clinical part	74.2	4.8

Table 2. Correlation between scores from in-training evaluation and scores from the written part of RCPT board certifying examination

Scores	Correlation	p-value
First-year monthly attending staff evaluation	0.36	< 0.001
Second-year monthly attending staff evaluation	0.31	0.002
Third-year monthly attending staff evaluation	0.32	0.002
First-year summative written examination	0.57	< 0.001
First-year summative clinical examination	0.46	< 0.001
Second-year RCPT formative written examination	0.68	< 0.001
Nursing staff evaluation	-0.13	0.48
Medical students evaluation	-0.2	0.27

Table 3. Correlation between scores from in-training evaluation and scores from clinical part of RCPT board certifying examination

Scores	Correlation	p-value
First-year monthly attending staff evaluation	0.16	0.13
Second-year monthly attending staff evaluation	0.09	0.38
Third-year monthly attending staff evaluation	0.29	0.004
First-year summative written examination	0.52	< 0.001
First-year summative clinical examination	0.43	< 0.001
Second-year RCPT formative written examination	0.43	< 0.001
Nursing staff evaluation	0.02	0.90
Medical students evaluation	-0.07	0.70

a four-step pyramid: knowledge (knows), competence (knows how), performance (shows how), and action (does)[3]. The clinical competence assessment of internal medicine resident is complicated and currently no unique method can perfectly fulfill this task.

Although the internal medicine training program in Faculty of Medicine Siriraj Hospital has been settled for more than 40 years, its conventional in-training evaluation of the trainee relies mainly on attending staffs evaluation. Until the past few years, different modalities and various sources of evaluation have been implemented. In this study, we demonstrate some degree of validity of our assessment tools, especially the structural examination, when using the final outcome of board certifying examination as a gold standard. We also demonstrate that, professional skill in working in harmony with nursing staffs is not well correlated with the final assessment by our certification system and differed from the results of Reed et al[4]. Our medical students also had a tendency to evaluate the internal medicine residents at a higher value as has been shown in the previously mentioned study, but did also not match with the results of our current final assessment. This indicates that skill as an educator must be evaluated separately from other skills.

However, some clinical competence is multidimensional construct, the Thai Board of Internal Medicine certifying examination may be not the perfect measure for the outcome of training. Written examination is mainly to evaluate the medical knowledge while the clinical examination aim to assess skills and some aspect of the attitudes. Different results of the correlation between medical knowledge and professionalism among internal medicine residents in the United States have been demonstrated[4,5]. Papadakis et al has shown that performance on behavioral and cognitive measures during residency training can predict future success in practicing internal medicine[6]. However, other aspects of competence, such as procedural skills, were not well correlated with board certification scores, and a verification system during training based on direct observation is essential[7].

On the job evaluation in the workplace offers a great opportunity for feedback and has an educational value conferred by putting emphasis on "real-time" assessment. Real life professional competences and qualities may be not adequately assessed by conventional examinations and in-training evaluation. Peer assessment in future medical practice after graduated is one potential source of evaluation; unfortunately, very few instruments designed for this task exist, and their development so far has focused mainly on reliability and feasibility[8]. An established training program should be oriented to develop proper and all-round methods for evaluation of clinical competence both during training and after graduation[9,10].

Conclusion

Strong correlation between scores from structural examinations during training and scores from Thai Board of Internal Medicine certifying examination was demonstrated. Other aspects of clinical competence, especially communication and interpersonal skills cannot be evaluated by our current measures.

Potential conflict of interest

None.

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เราสามารถทำนายผลสัมฤทธิ์ของการฝึกอบรมเพื่อวุฒิบัตรแสดงความรู้ความชำนาญในการประกอบวิชาชีพเวชกรรมสาขาอายุรศาสตร์ได้จากการประเมินในระหว่าง การฝึกอบรม หรือไม่

นิธิพัฒน์ เจียรกุล, สุพจน์ พงศ์ประสบชัย, กนกวรรณ บุญพิสิฏฐ์, ยิ่งยง ชินธรรมมิตร์, มานพ พิทักษภากร, อดิศักดิ์ มณีไสย, อภิรดี ศรีวิจิตรกมล, พรพรรณ กู้มานะชัย, อัจฉรา กุลวิสุทธิ์, ทวีศักดิ์ แทนวันดี, ชัยรัตน์ ฉายากุล, อุดม คชินทร

วัตถุประสงค์*: เพื่อประเมินผลการทำนายของการประเมินในระหว่างการฝึกอบรมต่อความสำเร็จในอนาคตจากการสอบ เพื่อวุฒิบัตรฯ อายุรศาสตร์*

วัสดุและวิธีการ*: รวบรวมข้อมูลแพทย์ประจำบ้านอายุรศาสตร์จำนวน 97 คน ที่เข้ารับการฝึกอบรม ในคณะแพทยศาสตร์ศิริราชพยาบาลระหว่างปีการศึกษา 2549-2551 ทำการศึกษาความสัมพันธ์ระหว่างคะแนนที่ได้จาการประเมินต่างๆ ระหว่างการฝึกอบรมกับคะแนนที่ได้จากการเข้าสอบเพื่อวุฒิบัตร*

ผลการศึกษา*: มีความสัมพันธ์อย่างมีนัยสำคัญระหว่างคะแนนสอบภาคทฤษฎีและภาคปฏิบัติเพื่อวุฒิบัตรกับคะแนนสอบภาคทฤษฎีและภาคปฏิบัติปลายปีที่ 1 และภาคทฤษฎีปลายปีที่ 2 ($r = 0.43$-0.68, $p < 0.001$) การประเมินรายเดือนในระหว่างการฝึกอบรมโดยกลุ่มอาจารย์มีความสัมพันธ์ต่ำกว่า ($r = 0.29 - 0.36$) ส่วนการประเมินรายเดือนจากนักศึกษาแพทย์และพยาบาลพบว่ามีความสัมพันธ์เชิงผกผัน ($r = -0.2$, $p = 0.27$ และ $r = -0.13$, $p = 0.48$).*

สรุป*: วิธีการประเมินบางอย่างในระหว่างการฝึกอบรมสามารถทำนายผลสัมฤทธิ์ของการสอบเพื่อวุฒิบัตรฯ อายุรศาสตร์ได้ แต่การประเมินจากผู้ร่วมปฏิบัติงานยังไม่สามารถแสดงถึงสมรรถนะและคุณภาพการปฏิบัติงานทางคลินิกในบางแง่มุมได้ดี*