

Step-2 Thai Medical Licensing Examination Result: A Follow-up Study

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Abstract

Introduction: The Thai medical students sat for the Medical Licensing Examination of Thailand (MLET) Step 2 for the first time in 2008. This paper analysed the first batch of Ramathibodi students taking the MLET Steps 1 and 2 in 2006 and 2008 respectively. **Materials and Methods:** The scores from the MLET Steps 1 and 2, and fifth-year cumulative grade point averages (GPAX) of 108 students were analysed. **Results:** Only 6 (5.6%) students failed the MLET Step 2 examination. Students who failed the MLET Step 1 were more likely to fail their MLET Step 2 (relative risk, 5.8; 95% confidence interval, 1.3-26.0). Students with low GPAX or scoring in the lowest quintile or tertile on the MLET Step 1 were also at increased risk of failing the MLET Step 2. **Conclusions:** The data suggest that performance on the MLET Step 1 and GPAX are important predictors of a student's chances of passing the MLET Step 2. Students with poor academic achievement or failing the MLET Step 1 should be given intensive tutorials to pass the medical licensing examination.

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Introduction

The Center for Evaluating and Accrediting Medical Competency of the Thai Medical Council has established the regulation that Thai medical graduates matriculated as of 2003 have to pass the Medical Licensing Examination of Thailand (MLET) to qualify for medical practice. There are 3 steps in this national test. Third-year medical students sit for the Step 1 test which is a paper-based 300-MCQ examination covering basic science subjects. Step 2 is taken by the fifth-year students regardless of the Step 1 result. It is also a paper-based 300-MCQ examination covering clinical science topics. Students must pass the Steps 1 and 2 in order to be eligible for the Step 3 test which includes the objective structured clinical examination (OSCE). The first Step 1 medical licensing examination for the third-year medical students was administered in 2006 and the test result of the Ramathibodi students has been previously reported.¹ The Step 2 test was first taken by the same cohort at the end of their fifth academic year in 2008. This study followed their performance in the Step 2 test and investigated factors associated with the outcome.

Materials and Methods

The MLET Step 1 tests the basic science knowledge of

the third year medical students. There are 300 one-best response multiple-choice questions selected by the examination committee of the Thai Medical Council. The table of specification (content outline) is shown on the Thai Medical Council website.² Two blocks, each containing 150 questions, are administered on a one-day test. The Center for Evaluating and Accrediting Medical Competency of the Thai Medical Council set the minimum passing score after the examination based on the test score and the standard error of measurement.

The MLET Step 2 assesses the clinical knowledge of the fifth-year medical students. The examination format is similar to the Step 1 test. There are 300 one-best response multiple-choice questions selected by the examination committee of the Thai Medical Council. The table of specification (content outline) is shown on the Thai Medical Council website.³ Two blocks, each containing 150 questions, are administered on a one-day test. The Center for Evaluating and Accrediting Medical Competency of the Thai Medical Council set the minimum passing score after the examination as in the Step 1 test.

The cumulative grade point average (GPAX) is averaged from each clerkship grades (weighted with the number of

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credits of the clerkship). Each clerkship grade is obtained by multiplying the grade with the number of credits of that clerkship.

The system of grading for clerkship GPA is as follows:

A = grade 4.00, B+ = grade 3.50, B = grade 3.00, C+ = grade 2.50,

C = grade 2.00, D+ = grade 1.50, D = grade 1.00, F = grade 0.00

Score of the MLET Steps 1 and 2 was obtained from the Center for Evaluating and Accrediting Medical Competency of the Thai Medical Council. There were 117 third-year Ramathibodi students sitting the Step 1 test in 2006, but only 108 of them took the Step 2 test in 2008. Cumulative GPAXs were retrieved from the medical education unit of the Faculty. Analysis was performed with SPSS software. Numerical data were tested for normality. Chi-square analysis was used to find associations between nominal variables. Pearson product-moment correlation coefficients were calculated for normally-distributed scores. Multivariate analysis was not performed because there were only 6 students in the fail group on the MLET Step 2.

Results

Outcome of MLET Steps 1 and 2 and GPAX

The first MLET Step1 was administered in 2006 and the passing score set by the Center for Evaluating and Accrediting Medical Competency based on the test score and the standard error of measurement was 163. One hundred and seventeen third-year Ramathibodi students took the examination. The passing rate was 80.3% with a mean score ($\pm$ standard deviation) of 179.2 ± 22.2 . The 20th and 33rd percentile ranks were 168 and 175 respectively.

The first MLET Step 2 was administered in 2008 and the passing score set by the Center for Evaluating and Accrediting Medical Competency was 165. Only 108 fifth-year students took the examination. The other 9 students from the same cohort were not eligible for the test due to academic difficulties (clerkship remediation or repetition). The passing rate was 94.4% with a mean score ($\pm$ standard deviation) of 189.7 ± 24.7 . The 20th and 33rd percentile ranks were 179 and 187 respectively.

The mean ($\pm$ standard deviation) GPAX of the fifth-year students was 3.13 ± 0.33 (4.00 scale). The 10th, 20th, and 33rd percentile ranks were 2.69, 2.83 and 2.97 respectively.

Correlation of Test Scores and Academic Performance

The MLET Step 1 score correlated moderately with Step 2 score [$r = 0.51$ ($P < 0.001$)] but the correlation between GPAX and Step 2 score was higher [$r = 0.57$ ($P < 0.001$)]. The Step 1 score correlated well with GPAX, $r = 0.77$ ($P < 0.001$).

Association of the MLET Steps 1, 2 Outcome and GPAX

Analysis of the data showed that students failing the MLET Step1 were more likely to fail their MLET Step 2 with a relative risk of 5.8 (95% CI, 1.3-26.0). They were also at increased risk of having scores in the lowest quintile or tertile on the MLET Step 2 as well as the GPAX. Students scoring in the lowest quintile or tertile on the MLET Step 1 also had similar scoring on the MLET Step 2. They were more likely to have poor academic performance and finished in the lowest decile, quintile or tertile groups of GPAX (Table 1).

Students with GPAX in the lowest quintile and tertile had 9 and 10 times risk respectively of failing the MLET Step 2. Those who had GPAX in the lowest decile, quintile and tertile were more likely to score similarly in the MLET Step 2 (Table 2).

None of the students having score of at least 177 (39th percentile) on the Step 1 examination failed the Step 2 test. All students with GPAX of at least 3.11 (4.00 scale) or upper half of class (50th percentile) passed the Step 2 test.

Discussion

The passing rate (94.4%) of our first student cohort who sat for the MLET Step 2 was higher than those who sat for the Step 1 (80.3%). There were several explanations for this finding. Firstly, 9 students who were ineligible for the MLET Step 2 and required either clerkship repetition or remediation did not take the test. Secondly, the mock examination administered by the Faculty 6 months earlier

Table 1. Risks of Future Poor Examination Performance for Students Scoring Poorly on Their First Attempt on the MLET Step 1

	Fail step 1 (n = 16)	Lowest quintile Step 1 (n = 21)	Lowest tertile Step 1 (n = 36)
Fail Step 2	5.8 (1.3, 26.0)	8.8 (1.7, 44.8)	9.6 (1.2, 79.1)
Lowest quintile Step 2	3.8 (1.9, 7.9)	4.4 (2.1, 9.1)	3.6 (1.6, 8.2)
Lowest tertile Step 2	1.8 (1.1, 3.1)	2.1 (1.3, 3.4)	2.3 (1.4, 3.8)
Lowest decile GPAX	10.1 (3.3, 30.5)	10.6 (3.9, 29.1)	8.0 (2.3, 28.0)
Lowest quintile GPAX	5.8 (2.9, 11.6)	5.4 (2.6, 11.2)	10.9 (3.4, 34.7)
Lowest tertile GPAX	3.3 (2.1, 4.9)	3.1 (2.0, 4.9)	4.4 (2.4, 7.9)

GPAX: cumulative grade point average

Data are presented as relative risk (95% confidence interval)

Table 2. Risks of Performing Poorly on the First Attempt of the MLET Step 2 for Students with Low Cumulative GPAX

	Lowest decile GPAX (n = 11)	Lowest quintile GPAX (n = 21)	Lowest tertile GPAX (n = 36)
Fail Step 2	1.8 (0.2, 13.8)	8.8 (1.7, 44.8)	10.0 (1.2, 82.4)
Lowest quintile Step 2	2.2 (0.9, 5.4)	2.4 (1.1, 5.2)	3.7 (1.6, 8.5)
Lowest tertile Step 2	1.4 (0.7, 2.8)	3.7 (1.6, 8.5)	1.9 (1.1, 3.1)

GPAX: cumulative grade point average

Data are presented as relative risk (95% confidence interval)

delivered essential information regarding students' knowledge deficiency. Lastly, intensive tutorials for students 2 months before sitting the MLET Step 2 further improved their knowledge and preparedness for the test.

The table of specifications (content outline) of the MLET Steps 1 and 2 are similar to the content outlines listed in the USMEL Step 1⁴ and 2 Clinical knowledge (CK)⁵ respectively. Previous studies by Ogunyemi et al⁶ and Rifkin et al⁷ reported positive correlation between the USMLE Step1 and 2 ($r = 0.68$ and 0.66 respectively). We tested the relationship of the MLET Step 1 and 2 scores and found similar results ($r = 0.51$); the lower correlation coefficient may be due to the smaller sample size in our study.

Surprisingly, the strongest relationship was between the MLET Step 1 score and the fifth-year GPAX. We looked back to our data of this cohort and found that the correlation between the MLET Step1 score and the third-year GPAX was also high ($r = 0.78$, $P < 0.001$), which might explain the strong relationship between the MLET Step1 score and the fifth-year GPAX.

One important finding in this study is the potential ability to identify the "at risk" students. Students failing the MLET Step 1 or received low GPAX were at extremely high risk of MLET Step 2 failure. Students failing the MLET Step1 were 6 times at risk of failing the Step 2. This is consistent with the finding of Myles et al⁸ who reported a relative risk of 9.3 of failing the USMLE Step 2 for students failing the USMLE Step 1. Moreover, any of our students finishing in the lowest quintile or tertile of the MLET Step1 has 8 to 9 times risk of failing the MLET Step 2.

Previous studies showed that USMLE Step 2 score correlated with several clerkship grades e.g. family medicine⁹ and obstetrics and gynaecology,¹⁰ but the correlation with the cumulative GPAX has only been reported by Edelstein et al¹¹ which is consistent with this study. Our students' GPAX is derived from summation of several departmental clerkship grades. Although we did not study the association between each department grade and the MLET Step 2 score, we found that students with

GPAX in the lowest quintile and tertile groups had a substantial risk of failing the MLET Step 2.

In conclusion, our study reveals some information on predictors of the MLET Step 2 outcome of the first Ramathibodi cohort which will help the faculty to launch specific interventions for future high-risk students taking the examinations.

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