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A comparative study of basic manual hematology laboratory skill examination scores among 4 programs medical students of the Faculty of Medicine of Chulalongkorn University*

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Siritantikorn A, Wiwanitkit V. A comparative study of basic manual hematology laboratory skill examination scores among 4 programs medical students of the Faculty of Medicine of Chulalongkorn University. Chula Med J 2000 Aug; 44(8):.563 - 9

- Objective** : *To study the ability of medical students in basic laboratory skills*
- Setting** : *Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University*
- Design** : *Descriptive cross-sectional study*
- Subjects** : *All 2nd year medical students in academic year 1998, Faculty of Medicine, Chulalongkorn University*
- Methods** : *All subjects performed basic manual hematology skills-hematocrit, white blood count and white blood cell differentiation. They reported their results on form and these were checked using answer keys. The total score was set at 25 points. The score of each student was collect and analyzed.*
- Results** : *There were 215 subjects included in this study. There were 153 students from the conventional program, 31 from the MESRAP program, 17 from the CTPB program and 14 from the new program. The range of scores was 16.31 to 24.47 (mean = 20.39 and SD = 2.04). Most of the subjects (66 %) had high scores. No significant relation between score, sex, or medical program was found.*

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Conclusions : *The ability of the medical students in basic manual hematology laboratory skills was good. Continuous evaluation of medical students for laboratory and medical procedure skills is recommended.*

Key words : *Evaluation, Manual hematology laboratory skill, Medical student.*

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อัชฌาศัย ศิริตันติกร, วิโรจน์ ไวกานิชกิจ. การศึกษาเปรียบเทียบผลการประเมินทักษะการตรวจทางโลหิตวิทยาเบื้องต้นของนิสิตแพทย์ 4 โครงการของคณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย. จุฬาลงกรณ์เวชสาร 2543 ส.ค.; 44(8): 563 - 9

- วัตถุประสงค์** : เพื่อศึกษาความสามารถด้านทักษะของนิสิตในการตรวจทางโลหิตวิทยาเบื้องต้น
- สถานที่ทำการศึกษา** : ภาควิชาเวชศาสตร์ชั้นสูง คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
- รูปแบบการศึกษา** : การศึกษาเชิงพรรณนาแบบตัดขวาง
- กลุ่มที่ทำการศึกษา** : นิสิตแพทย์ชั้นปีที่ 2 คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ทั้งหมด 215 คนในปีการศึกษา 2541
- วิธีการศึกษา** : กำหนดให้กลุ่มที่ทำการศึกษาทุกรายทำการตรวจทางห้องปฏิบัติการโลหิตวิทยาเบื้องต้นคือ การหาค่าฮีมาโตคริต การนับจำนวนเม็ดเลือดขาว และการนับแยกชนิดของเม็ดเลือดขาว ทำการตรวจสอบผลการรายงานค่าด้วยกฎแจคค่าตอบโดยมีคะแนนเต็ม 25 คะแนน รวบรวมข้อมูลที่ได้จากนิสิตแต่ละคนแล้วทำการวิเคราะห์
- ผลการศึกษา** : มีนิสิตจำนวน 215 คนในการศึกษานี้ เป็นนิสิตในโครงการปกติจำนวน 153 คน เป็นนิสิตในโครงการแพทย์แพทย์ชนบทจำนวน 31 คน เป็นนิสิตในโครงการผลิตแพทย์แนวใหม่จำนวน 17 คน และ เป็นนิสิตในโครงการสำหรับผลิตแพทย์เพิ่มจำนวน 14 คน ช่วงของคะแนนของนิสิตอยู่ระหว่าง 16.31 ถึง 24.47 คะแนน นิสิตส่วนใหญ่ (ร้อยละ 66) จะทำการตรวจได้ในเกณฑ์ระดับคะแนนที่ดี ทั้งนี้ไม่พบความสัมพันธ์อย่างมีนัยสำคัญทางสถิติสำหรับระดับคะแนนที่ได้กับเพศหรือโครงการการศึกษาของนิสิตแพทย์
- สรุป** : ความสามารถด้านทักษะของนิสิตในการตรวจทางโลหิตวิทยาเบื้องต้นอยู่ในเกณฑ์ระดับคะแนนที่ดี ทั้งนี้ได้แนะนำให้ทำการประเมินทักษะการตรวจทางห้องปฏิบัติการตลอดจนการทำหัตถการทางการแพทย์อย่างต่อเนื่อง
- คำสำคัญ** : การประเมิน, ทักษะการตรวจทางโลหิตวิทยา, นิสิตแพทย์

All graduate physicians must be able to perform basic laboratory skills correctly. Medical students can develop their skills by practice during laboratory medicine training. As the medical students must perform such skills when they become physicians, they should practice the laboratory procedures. Evaluation of the medical students after finishing the medical training is very important to detect the problems and plan for improvement.^(1,2)

The Faculty of Medicine of Chulalongkorn University is a large medical school in Thailand. There are many medical programs in the faculty. There are also many laboratory and medical skills taught in the curriculum. Although there have been some reports about evaluation of this medical training,⁽³⁻⁴⁾ there have been no specific reports about evaluation of laboratory procedure training. Therefore, this study was to evaluate the ability of the medical students in performing basic laboratory procedures.

The laboratory procedures in this study were basic hematology procedures - hematocrit, white blood count and white blood cell differentiation - which all graduate physicians are required to perform.⁽⁵⁾ Results from this study can help improve laboratory medicine education for medical students.

Materials and Methods

This study was designed as a descriptive study aimed to evaluate basic laboratory skills of medical students. The subjects in this study were all 2nd year medical students who passed the training course in laboratory medicine during academic year 1998. Dividing by program, there were four programs of students from conventional program, Medical Education for Students in Rural Area Project (MESRAP)

program, Community-targeted Problem-Based (CTPB) program, and a new program to increase the number of physicians. All subjects performed manual hematocrit, and conducted white blood counts and blood smear differentiations on the same set of samples in the same one-hour period. They were then asked to record their results in reporting forms. Each report form was evaluated using answer keys produced by test results from manual examination of the same samples by expert medical technologists and examination by automated hematology. After checking, each result was evaluated and transformed into a score with the highest score being 25. All scores were collected and then analyzed. Descriptive statistical analysis was performed where it was appropriate. Comparisons among groups of medical students was carried out using a significance level of 0.05. Comparison of average scores among all groups was performed using the F - test and independence was tested using the Chi-square test.

Results

There were 215 subjects included in this study (Table 1). There were 153 students (90 males and 63 females) from the conventional program, 31 (12 males and 19 females) from the MESRAP program, 17 (6 males and 11 females) from the CTPB program and 14 (4 males and 10 females) from the new program. The range of scores of all subjects was 16.31 (65.2 %) to 24.47 (97.9 %) The mean was 20.39 (81.6 %) and the standard deviation was 2.04.

The average score of the conventional program students was 20.07 ± 1.89 , MESRAP program students was 20.00 ± 2.35 , CTPB program students was 20.16 ± 1.95 , and new program students was 20.76 ± 2.14 .

There was no significant difference among scores of all programs of students ($P < 0.05$) (Table 2).

Classification of scores was performed using modified evaluation criteria of the Ministry of Education:

High $> 80\%$, Fair $50 - 79\%$, Low $0 - 49\%$. (Table 3).

There was no significant relation between level of score and sex ($P > 0.3$) and between level of knowledge and students program ($P > 0.99$).

Table 1. Subjects in this study.

	Number / percentage	
	Male	Female
Conventional program	90/41.9	63/29.3
MESRAP	4/1.9	10/4.6
CTPB	12/5.6	19/8.8
New program	6/2.8	11/5.1

Table 2. Scores from examination.

Program	Mean (point)	Standard deviation
Conventional program	20.07	1.89
MESRAP	20.00	2.35
CTPB	20.16	1.95
New program	20.76	2.14

Table 3. Classification of scores.

Score	Male				Female			
	A	B	C	D	A	B	C	D
High	57	6	4	3	45	13	7	7
Fair	33	6	2	1	18	6	4	3
Low	0	0	0	0	0	0	0	0

A: conventional program

B: MESRAP

C: CTPB

D: new program

Discussion

Basic laboratory skills are necessary for all physicians, especially in primary health care centers. Good laboratory skills can help diagnose many diseases, therefore, all medical students should develop these skills before graduation. As it is the duty of medical schools to produce the best physicians, evaluation of ability of the students is required.

The Chulalongkorn Faculty of Medicine has many programs for the physician production process. Although there have been reports⁽³⁻⁴⁾ evaluating medical training, they deal with clinical skill and were conducted in the last year of study. Early detection of problems in education can provide good resolution, thus evaluation in the early period of the education is useful.

This study evaluated pre-clinical year medical students who learned altogether. The results can reflect the nature of the students better than results performed on clinical year medical students who had different experiences due to the in ward-based education.

The study revealed that there was no significant difference among all groups of students. Therefore, development of laboratory skills in all groups did not differ, and this result did not match a previous study which concluded that there were significant differences among programs of medical students.⁽³⁻⁴⁾

From this study, most of the students had high scores and none had low scores. This can imply that the present training for basic hematology skills is quite good. Although the ratio of male subjects was significant lower than for females, there was no significant difference between score and sex. Furthermore, there was no significant difference

between score and the student's education program. This can indicate that the quality of the medical students is equivalent. Thus the medical students can develop quite good skills in their education.

This study concerns the importance of manual laboratory skills which medical students have to face in the future. Both laboratory and medical procedure skills are very important as these skills must be used in real medical practice.⁽⁶⁾ Knowledge alone is not sufficient but must be enhanced with a good attitude and practice. Both laboratory and procedural skills should be taught well to the medical students. Continuous evaluation of the students success in studying is also recommended. But the evaluation of should be of their knowledge and also their attitude and practical skills.

This study deals with basic laboratory skill requirements of all graduate physicians. It does not include other complicated laboratory skills, requiring much experience. Every medical procedure and laboratory skill of the students should be evaluated⁽⁷⁾ and corrected when there is a pitfall before they graduate because it is the patient's right to receive the best.⁽⁸⁾ It is the duty of all medical staff in the university hospital to promote rational and correct medical practice for their students.

Conclusions

This was an evaluation of basic manual hematology skills of 215 medical students. It revealed that most of the students had rather good scores. No significant difference between score, sex, or medical program of the students was found. The importance of student's laboratory skill evaluation was discussed and recommended.

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