

9-1-2000

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### Recommended Citation

Sanpawat, S. (2000) "The 6th year medical students' evaluation of pediatricclinical teaching in the academic year 1998," *Chulalongkorn Medical Journal*: Vol. 44: Iss. 9, Article 3.

Available at: <https://digital.car.chula.ac.th/clmjjournal/vol44/iss9/3>

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## The 6<sup>th</sup> year medical students' evaluation of pediatric clinical teaching in the academic year 1998

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Sanpavat S. The 6<sup>th</sup> year medical students' evaluation of pediatric clinical teaching in the academic year 1998. Chula Med J 2000 Sep; 44(9): 659 - 67

- Objective** : *To evaluate the clinical teaching by surveying the 6<sup>th</sup> year medical students' perception with regard to their knowledge, skill and attitude attributed to their learning and teaching of pediatrics.*
- Settings** : *Department of Pediatrics, Faculty of Medicine, Chulalongkorn University.*
- Design** : *Descriptive study*
- Subject** : *The 6<sup>th</sup> year medical students, year 1998 -1999, during their 6 weeks rotation to the Pediatric Department.*
- Method** : *A questionnaire of 5 point Likert scales and semi-structured items was distributed at the end of the students' rotation. The questions concerned the students' perception of the knowledge gained from the lectures and rotation among different patient wards, their ability in manual and interpretive skills and their perception of the attitudes, taught or displayed, by the teachers and residents.*
- Results** : *The response rate was 71%. The students rated the lectures and the clinical experience in the general, infectious, and immunocompromised wards, the outpatient clinic and the neonatal unit highly in their gaining knowledge (score 3.5-4.4). The well baby clinic and cardiology ward were rated as average (score 3.2-3.3). Ninety four percent revealed that they could recognise which patient needed to be referred, and 71% reported a sufficient basic*

*knowledge to pursue continued education. Half of the students were satisfied with the opportunity to manage common diseases and only one-third regarded their knowledge as adequate for emergency management. Forty two to 60 % had confidence in performing physical examination and data gathering. Overall, the students felt competent in interpreting laboratory data, but inadequate in performing tasks involving manual skill. More than half of the students never performed some life-saving procedures, such as cardiopulmonary resuscitation, endotracheal intubation and intercostal drainage. Ninety-nine and 89 % perceived that a positive attitude was taught or displayed by the teachers and the residents respectively.*

**Conclusion** : *The students gave high scores for the teaching of knowledge, staff attitude and interpreting laboratory data. They graded a low confidence in manual skill, data gathering and physical examination. This study might provide a perspective to help in improving the quality of teaching in these weak areas.*

**Key words** : *Clinical teaching, Evaluation, Perception.*

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Received for publication. June 15, 2000.

สุวิมล สรรพวัฒน์. การประเมินการเรียนการสอนกุมารเวชศาสตร์ทางคลินิกโดยนิสิตแพทย์ชั้นปีที่ 6 ในปีการศึกษา 2541. จุฬาลงกรณ์เวชสาร 2543 ก.ย; 44(9): 659 - 67

**วัตถุประสงค์** : เพื่อประเมินการเรียนการสอนกุมารเวชศาสตร์ทางคลินิก โดยศึกษาจากการประเมินของนิสิตแพทย์ชั้นปีที่ 6 ว่าได้รับความรู้ มีทักษะ และมีการเรียนรู้ด้านเจตคติหรือไม่อย่างไร

**สถานที่** : ภาควิชากุมารเวชศาสตร์ คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

**รูปแบบ** : การศึกษาเชิงพรรณนา

**กลุ่มตัวอย่าง** : นักศึกษาแพทย์ชั้นปีที่ 6 ซึ่งหมุนเวียนเข้าเรียนในภาควิชากุมารเวชศาสตร์นาน 6 สัปดาห์ปีพ.ศ.2541-2542

**วิธีการ** : นิสิตตอบแบบสอบถาม (5 point Likert scales และ semi-structured items) ในสัปดาห์สุดท้ายของการเรียนการสอน โดยประเมินว่า จากการสอนแบบบรรยายและการทำงานในหอผู้ป่วยต่าง ๆ นั้น ตนเองได้รับความรู้และทักษะเกี่ยวกับการซักประวัติ ตรวจร่างกาย การแปลผลการตรวจทางห้องปฏิบัติการ และการทำหัตถการมากน้อยเท่าใด และในด้านเจตคติได้สังเกตว่าอาจารย์หรือแพทย์ประจำบ้านเคยสอน หรือแสดงออกทางด้านจริยธรรมต่อผู้ป่วยหรือไม่

**ผลการศึกษา** : นิสิตตอบแบบสอบถามคิดเป็นร้อยละ 71 และประเมินว่าได้รับความรู้มากจากการสอนแบบบรรยาย และการปฏิบัติงานในหอผู้ป่วยทั่วไป หอโรคติดเชื้อ หอผู้ป่วยภูมิคุ้มกันบกพร่อง หอผู้ป่วยนอก และหอทารกแรกเกิด (คะแนน 3.5-4.4) ได้รับความรู้ระดับปานกลางจากหอผู้ป่วยโรคหัวใจ และคลินิกเด็กดี (คะแนน 3.2-3.3) ร้อยละ 94 ประเมินว่า มีความรู้ที่จะตัดสินใจได้ว่าผู้ป่วยกรณีใดควรส่งต่อ ร้อยละ 71 คิดว่ามีความรู้พื้นฐานที่จะศึกษาค้นคว้าด้วยตนเองต่อไป นิสิตครึ่งหนึ่งคิดว่ามีโอกาสศึกษาโรคที่พบบ่อยเพียงพอ และนิสิตประมาณหนึ่งในสามเท่านั้นที่คิดว่าตนมีความรู้พอที่จะรักษาผู้ป่วยในภาวะฉุกเฉิน ร้อยละ 42 ถึง 60 มั่นใจในการตรวจร่างกายและซักประวัติ ส่วนมากมีความมั่นใจในการแปลผลทางห้องปฏิบัติการ แต่ไม่มั่นใจในการทำหัตถการบางอย่าง มากกว่าร้อยละ 50 ไม่เคยทำหัตถการที่จำเป็นในการช่วยชีวิต เช่น การกู้ชีพ การใส่ท่อช่วยหายใจ และการเจาะปอด เป็นต้น นิสิตร้อยละ 99 และ 89 ประเมินว่า ได้รับการสอนด้านเจตคติ หรือสังเกตเห็นการแสดงออกด้านเจตคติจากอาจารย์และแพทย์ประจำบ้านตามลำดับ และส่วนมากเป็นการแสดงออกทางด้านบวก

**สรุป** : นิสิตประเมินว่า ได้รับความรู้ ได้รับการสอนด้านเจตคติ และมีความมั่นใจในการแปลผลการตรวจทางห้องปฏิบัติการในเกณฑ์สูง แต่มีความมั่นใจน้อยในทักษะและการทำหัตถการบางอย่าง การศึกษานี้คงจะเป็นแนวทางในการปรับปรุงการเรียนการสอนในส่วนด้อยให้มีคุณภาพยิ่งขึ้น

To ensure the success of education, quality of teaching is an important component of the process. Assessing teaching quality and effectiveness is difficult and mostly subjective. Student surveys have been generally applied for these evaluations, although Speer<sup>(1)</sup> introduced peer reviews as more objective.

The curriculum of the Pediatric Department, Faculty of Medicine, Chulalongkorn University is based on the 1993 Medical Council Standard,<sup>(2)</sup> and clinical teaching contains the 3 domains of knowledge, skill and attitude. In 1998 the clinical learning experience of the 6<sup>th</sup> year medical students<sup>(3)</sup> was altered to facilitate an increase in involvement with out patients and neonates, which was considered more desirable for general medical graduates than subspecialty exposure. The total of 6 weeks rotation term includes 2 weeks in the newborn unit; a fixed date of once a week of outpatient clinic for 6 weeks; and the remaining 4 weeks are spent in 2 out of 4 wards of general, infectious, cardiology and immunocompromised diseases. The teaching of theory includes 12 hours of core-lectures about common diseases, emergency management, drugs, psychiatric problems and holistic approach.

The objective of this study was to evaluate the quality of teaching by exploring the 6<sup>th</sup> year medical students' perception with regard to the knowledge, skill and attitude attributed to the learning and teaching during their 6 weeks rotation in the Pediatric Department.

### Sample

The 6<sup>th</sup> year medical students of the Faculty of Medicine, Chulalongkorn University were divided into 8 groups. These groups rotated among different

departments of the faculty through the year. In the Pediatric Department, the rotation term was 6 weeks. All students of each group participated in this study during the last week of their rotation term.

### Method

The evaluation was a questionnaire of 5 point Likert scales, ranging from 1 = minimum to 5 = maximum, and semi-structured items.

The first section of the questionnaire was about knowledge. The students were requested to rate the extent of knowledge they obtained from the 12 hours of core lectures, and from the ward round, case discussion and clinical problem solving during their rotation in different wards. This section also contained items inquiring about the students' views regarding their opportunity in dealing with common clinical conditions, their competency of emergency management, the realization of self-limitations and the adequacy of the basic knowledge gained for them to pursue continued education.

The second section of psychomotor evaluation, the students were requested to indicate their confidence in gathering history medical data, performing a physical examination, interpreting 9 common laboratory data, chest and abdominal roentgenograms and giving counseling. The items concerning manual skill were selected from pediatric practice as based on the 1993 Medical Council Standards.<sup>(2)</sup>

The third part of the questionnaire was concerned with perception of attitude. The students answered the question of whether attitude to the patients was taught or displayed by the teachers and pediatric residents during the time that they had contacted with them, and whether it was positive or

negative.

The questionnaire was reviewed by three experts for content validity. The pretest was done by the first year residents and the ambiguity of the questionnaire was corrected. Reliability analysis was done using alpha-coefficients, with the result of 0.9590 in the items of knowledge, 0.8922 in the items of laboratory data and investigations, and 0.8923 in the items of procedures.

Data analysis was performed using mean, standard deviation, and percentage of the returned answers.

## Results

The total number of 6<sup>th</sup> year medical students in the year 1998-1999 was 136. Ninety-six returned the questionnaire, giving a 71% response rate.

In the section concerning knowledge, the students scored high in the extent of their knowledge obtained from the core lectures, and the clinical experience in most of the wards (score 3.5-4.4). Rotations in the cardiology ward and well baby clinic were rated average (score 3.2-3.3) (Table 1). Ninety four percent of the students indicated that the knowledge they acquired during the term of rotation

Table 1. Mean ( $\pm$ SD) values of students rating the knowledge benefited from lectures and rotation on a 1 (minimum) to 5 (maximum) scale.

Items (knowledge)	N	Rating
1. Core lecture (12 topics)		
Endocrine emergency	94	4.4 $\pm$ 0.6
Neonatal emergency	95	4.2 $\pm$ 0.6
Fluid and electrolyte	96	4.2 $\pm$ 0.7
Common neurological problem	93	4.2 $\pm$ 0.6
Common pediatric emergency	94	4.1 $\pm$ 0.6
Hematology and oncology	90	4.1 $\pm$ 0.7
Growth and development	95	4.1 $\pm$ 0.6
Child psychiatry	93	4.0 $\pm$ 0.6
Nephrology	90	4.0 $\pm$ 0.7
Drugs and their dosage	96	3.9 $\pm$ 0.7
Cardiovascular emergency	95	3.8 $\pm$ 0.7
Learning pediatrics, holistic	92	3.7 $\pm$ 1.0
2. General pediatrics	69	4.1 $\pm$ 1.6
3. Outpatient ward	92	4.0 $\pm$ 0.8
4. Infectious clinic*	44	4.0 $\pm$ 0.9
5. Neonatal unit	92	3.7 $\pm$ 0.8
6. Immunocompromised ward*	42	3.6 $\pm$ 0.8
7. Cardiology ward*	38	3.3 $\pm$ 1.0
8. Well baby clinic	88	3.2 $\pm$ 1.3

\* The nature of the patients and the wards are classified in the same categories as specialty, and the students were divided to rotate in only one of these wards.

was adequate for them to recognize which patient was within their professional ability to manage and which needed to be referred. Seventy one percent reported enough basic knowledge to pursue self-continued education, 49 % were satisfied with their opportunity to manage common diseases and only 35 % regarded their knowledge as sufficient to deal with emergency conditions.

In the psychomotor domain, 60 % of the students indicated no difficulty in gathering medical history data, and only 42 % revealed confidence in performing a physical examination. They rated high confidence in interpreting CBC, urinalysis, stool examination, electrolytes, CSF and liver function tests (score 3.7-4.3) and average confidence in interpreting the roentgenograms and EKG (score 2.5-3.3) (Table 2). Confidence in counseling was also rated average with a score of 2.8.

In the area of manual skill, more than half of

the students had not performed cardiopulmonary resuscitation, endotracheal intubation, intercostal drainage, paracentesis, removal of foreign body from the nose, suprapubic tap, venesection or CVP measurement. Gastric intubation and lavage and venepuncture were the procedures that all students had practiced and 95 % judged that they could perform them confidently. However, they felt that they still needed supervision for some procedures (Table 3).

In the area of attitude, 99% of the students observed that the attitude toward the patients were taught or displayed by the teachers during the care of the patients. Eighty nine percent had the same experience with the pediatric residents. Of all the teacher's display of attitude was perceived as positive by 81 % and 19% felt both positive and negative attitudes had been shown; while 73 % of the residents' and 19 % was positive and 27% both positive and negative.

**Table 2.** Mean ( $\pm$ SD) values of students rating the confidence in interpretation on a 1 (minimum) to 5 (maximum) scale.

Laboratory data and investigations	N	Ratings
1. CBC	92	4.3 $\pm$ 0.6
2. urinalysis	95	4.3 $\pm$ 0.9
3. stool exam	94	4.2 $\pm$ 0.6
4. electrolyte	93	4.1 $\pm$ 0.8
5. CSF	94	3.9 $\pm$ 0.8
6. liver function test	93	3.7 $\pm$ 0.8
7. chest X-ray	93	3.3 $\pm$ 0.9
8. abdominal X-ray	91	3.3 $\pm$ 0.9
9. EKG	91	2.5 $\pm$ 1.0

Abbreviation CBC - complete blood count, CSF - cerebrospinal fluid, EKG - electro cardiogram.

Table 3. Opportunity to practice procedures and perceived confidence.

Procedures	N	Never done (%)	Perception for next performance, (if the procedure was previously practiced) (%)		
			High confidence, perform without supervision.	Average confidence, supervision still needed	No confidence at all
1. Gastric intubation and lavage	94	2	95	3	0
2. Venepuncture	92	0	95	5	0
3. Urethral catheterization	83	14	80	5	1
4. O <sub>2</sub> therapy	91	0	70	27	3
5. Parenteral fluid infusion	95	15	59	25	1
6. Postural drainage	92	14	58	25	3
7. Lumbar puncture	101	13	58	29	0
8. Paracentesis : abdomen	63	54	30	14	2
: thorax	86	62	14	21	3
9. Venesection and CVP* measurement	96	58	21	18	3
10. Removal of F.B.* from the nose	95	65	17	17	1
11. Endotracheal intubation	93	52	12	32	4
12. Intercostal drainage	95	69	7	21	3
13. Suprapubic tap	94	76	6	13	5
14. Cardiopulmonary resuscitation	90	54	3	36	7

\* CVP - central venous pressure, F.B.- foreign body

## Discussion

Eventhough teaching in Pediatrics includes lecture, ward round, case conference, discussion and self-directed learning, lecturing is still the method of teaching of which the students appreciated most. The assessment of their high gain of knowledge from the general ward and outpatient clinic can be viewed as satisfactory, since the aim of the department is to have students familiar with general problems rather than the specific ones. However, half of the students

thought they were not provided enough opportunity in studying common clinical conditions. This may have stemmed from the misunderstanding that common diseases were always admitted to the general ward (in which the rotation lasted only 2 weeks). In fact, the students could have encountered some common conditions in the specialty wards as well, such as, urinary tract infection, contagious childhood infectious diseases requiring isolation, congestive heart failure, etc.



Most of the students rated their knowledge to be sufficient to recognize cases that were beyond their ability and to prepare them adequately for self-continued education. This complies with several recent medical curriculums<sup>(4,5)</sup> that emphasize self-directed learning and preparing the student for continued education. Only 35% scored sufficient knowledge in the area of emergency management, in which they engaged only when they were on call. The compulsory rotation of the emergency unit is in the curriculum of another department, and some groups of the students who answered the questionnaire had not yet experienced this rotation .

In the psychomotor area, the results indicated that the teaching of medical history data gathering and performance physical examination are in need of improvement, especially since they are the basic skills that every student should manage best. The students had high confidence in interpreting most laboratory data. The more often a particular type of laboratory investigation was done, the more experience and confidence they gained, such as CBC, urinalysis, stool exam and electrolyte which were routinely done. Interpreting the EKG was rated lowest among these skills. This may have been due to the lack of specification the types of abnormal EKG that are expected to be known by the students in the questionnaire. Not surprisingly, the ability in counseling was scored average. To feel capable of giving counseling, the students need not only knowledge and experience, but communication skills as well. The result supports the need for close supervision and improvement in this area.

More than 50 % of the students had not performed some important procedures - especially

cardiopulmonary resuscitation. Different teaching techniques may be more effective for improving different elements of skill learning.<sup>(6)</sup> Since 1999, the department has provided a center for self-directed learning<sup>(7)</sup> using different kinds of media, such as slides, video, computer-assisted instruction and models. Therefore, learning opportunities are available for practice and enhancement of competency. Seventy six percent of students had not performed a suprapubic tap. This procedure is required when uncontaminated urine is needed for culture and is performed only in the specific age group of 0-3 months. It is not a necessary procedure in life threatening or emergency conditions, and the chance to perform it and successfully obtain the specimen is small. It, therefore, should be reconsidered whether suprapubic tap is still required as a "must" for the undergraduate medical student as indicated in the Medical Council Standards.

The importance of teaching attitude has increasingly gained recognition. London<sup>(8)</sup> reported the benefits of a course in the ethical dimension of human rights for undergraduate students. The study of attitude is most adequate and effective when it is based on a study of observed overt behavior.<sup>(9)</sup> The clinical teacher has been referred as a role model for the undergraduate students.<sup>(10,11)</sup> Since the students' task is stressed on the clinical experience, the questions about learning attitude was constructed for them to indicate whether the matter of attitude was taught verbally or expressed in action or behavior by their supervisors during their engagement in the care of the patients, and whether it was positive or negative by their own judgement. Overall, the students felt that attitude was taught or expressed positively

by the teachers and the residents. Although the questionnaire did not probe into the detail and nature of this topic, and the understanding about the attitude in the students' concept cannot be clearly explained, but in general it can be appreciated that the pediatric residents and staffs are concerned with the professional attitude to the patients, and have conveyed this message to the students. Meanwhile the students are aware of the teaching in this area during their clinical experience

This study may not allow conclusions to be made about the total quality and effectiveness of the teaching, since the students' actual competency and other factors that influence achievement, such as educational environment<sup>(12)</sup> are not taken into account. Nevertheless, efforts should be continued to improve the weak areas identified.

### Conclusions

The undergraduate students rated high in the teaching of knowledge and attitude. They had confidence in interpreting most of the laboratory data, but felt less competent in some manual skills. This study might shed some light on areas of clinical pediatric teaching that are in need of improvements.

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