



# EDUCATION FOR HEALTH

## ORIGINAL RESEARCH PAPER

# Determinants of Effective Clinical Learning: A Student and Teacher Perspective in Saudi Arabia

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## A B S T R A C T

**Context:** Graduating clinically competent medical students is probably the principal objective of all medical curricula. Training for clinical competence is rather a complex process and to be effective requires involving all stakeholders, including students, in the processes of planning and implanting the curriculum. This study explores the perceptions of students of the College of Medicine at King Abdul-Aziz Bin Saud University for Health Sciences (KASU-HS), Riyadh, Saudi Arabia of the features of effective clinical rotations by inviting them to answer the question: “Which experiences or activities in your opinion have contributed to the development of your clinical competence?” This college was established in 2004 and adopted a problem-based learning curriculum.

**Methods:** This question was posed to 24 medical students divided into three focus groups. A fourth focus group interview was conducted with five teachers. Transcriptions of the tape-recorded focus group interviews were qualitatively analyzed using a framework analysis approach.

**Findings:** Students identified five main themes of factors perceived to affect their clinical learning: (1) the provision of authentic clinical learning experiences, (2) good organization of the clinical sessions, (3) issues related to clinical cases, (4) good supervision and (5) students’ own learning skills. These themes were further subdivided into 18 sub-themes. Teachers identified three principal themes: (1) organizational issues, (2) appropriate supervision and (3) providing authentic experiences.



**Conclusion:** Consideration of these themes in the process of planning and development of medical curricula could contribute to medical students' effective clinical learning and skills competency.

**Keywords:** Clinical learning, clinical teaching, undergraduate teaching, students' perception, teachers' perception

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## Introduction

The principal aim of medical education is to begin to provide medical students with necessary competencies in both basic medical sciences and clinical skills. Traditionally the first two to three years in medical education are devoted to basic medical sciences teaching, whereas clinical skills teaching takes place at the next stage. Clinical skills are typically taught by exposing students to patients through clinical clerkships. During these clerkships, students acquire diagnostic treatment and patient-physician communication skills.

Clinical clerkships are commonly organized by rotating students through different disciplines. The experiences of students in these rotations are variable, largely due to the unpredictable availability of patients with specific clinical findings and the occurrence of clinical situations. This makes teaching in clinical rotations much less structured than teaching in basic medical sciences. Nevertheless, clinical rotations are crucial to the training of medical students, as they provide an opportunity for students to first apply their knowledge and be introduced to the environment of their future work.

Clinical skills teaching is provided both in ambulatory and inpatient settings. This combination of teaching settings is likely to provide the most effective approach to medical students<sup>1,2</sup>.

The literature suggests that clinical learning is affected by many factors, including the varieties of clinical cases encountered, the quality of supervision and feedback, good organization of the experiences and characteristics of learners and teachers<sup>3-5</sup>. However, the impact of some of these factors on students' clinical learning, when tested, is not always confirmed<sup>6,7</sup>.

The present study has been carried out with the following objectives: to explore students' and teachers' perceptions of the features of clinical experiences and activities that promote students' clinical competence, and to identify characteristics of high quality clinical rotations.

## Study Context

This study has been conducted in the College of Medicine at King Abdul-Aziz Bin Saud University for Health Sciences (KASU-HS), Riyadh, Saudi Arabia. This college was established in 2004 and adopted a problem-based learning curriculum. The first two and a half years of the curriculum are devoted to a preparatory phase and the teaching of basic and clinical sciences, and the clerkship phase takes place in the remaining one and one-half year. During the clerkship phase, students acquire experience in the major clinical disciplines of Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, and Family and Community Medicine, in rotations that vary from nine to sixteen weeks. At the time of the study, admission to the college in Riyadh was limited to male students, because some of its facilities, including those for females, were still under construction.



## Methods

This study is a qualitative analysis using focus group interviews of students and teachers.

The study sample was composed of the first cohort of undergraduate medical students of the College of Medicine. All 24 students who had finished their 9-week rotation in the Family Medicine block in June 2008 were invited to participate in the study. This block is the last clinical rotation in the curriculum.

### *Focus groups*

The 24 students were divided into three groups (SFG1, SFG2, and SFG3).

Each focus group interview began by thanking the students for their participation, followed by a brief explanation of the objectives of the study. Then the discussion was initiated with the question: “*Which experiences or activities, in your opinion, have contributed to the development of your clinical competence?*”

All students were encouraged to answer by reflecting back on their clinical rotations and recalling useful learning experiences and activities. The facilitator encouraged students to give examples to illustrate the meaning of their responses. Following each stated opinion, the facilitator briefly summarized the point as he/she heard it to verify its meaning and to allow for further comments or clarifications by the students. Students were also instructed to restate experiences if they thought they had been useful to them also.

All interviews were audiotaped and transcribed. All of the group discussions were facilitated by the main researcher. The facilitator kept notes during all discussions, documented the main points and made comments on the interactions of the members of the groups during discussions, prompting students to be more specific when necessary. Each focus group discussion lasted about one hour and continued until no more new points were expressed by participants.

### *Focus group interview with the teachers*

We also conducted a focus group interview with teachers to learn their views by posing the same question that was posed to the students. Seven clinical teachers were invited to participate based on their involvement in the clinical training and supervision of medical students, as they each acted as a block director or co-director of a clinical rotation. Their disciplines were Family Medicine (2), Obstetrics/Gynecology (2), General Surgery (1) and Pediatrics and Pediatric Surgery (2). This interview also lasted for about one hour and was facilitated by the lead investigator. In order not to affect teachers’ opinions, they were kept unaware of the details of the students’ focus group discussions.

The audiotapes were transcribed verbatim by the principal investigator prior to analyses. The initial step of analysis was to have the researchers become familiar with the data and acquire a contextual sensitivity by first immersing themselves in the setting of the research<sup>8</sup>, a key first or “familiarization” stage of the analytical process of qualitative research<sup>9</sup>. The next four steps of the framework analysis used involved identifying a thematic framework, indexing, charting and mapping and interpretation<sup>10</sup>.



All data were compiled from the focus group interviews held with students and teachers. Key statements were highlighted and categorized into general themes. The audiotapes and transcriptions were further independently analyzed by a second investigator (MEM). The two researchers (AAH and MEM) discussed the summaries, and modified them until a consensus was reached.

The findings of the analyses were then presented to all participants for validation through “member checking”; participants were able to modify or suggest changes to the interpretation of data<sup>11</sup>. The participants had few suggestions and indicated that the summaries accurately reflected the focus group discussions.

The study was approved by the research ethics committee at the King Abdullah International Research Center.

## Findings

### *Student focus group interviews*

A total number of 24 medical students participated in this qualitative study. All were males, with a mean age of 29.8 years (+/- 1.6 SD).

Five main themes were identified for the experiences and activities students felt contributed to their clinical competence: (1) cases' related issues, (2) authenticity of the clinical experiences, (3) organizational issues of clinical teaching sessions, (4) supervisor factors and (5) issues related to students' learning skills.

Table 1 shows examples of students' responses in each of the five themes.

The five main themes are further divided into sub-themes, as shown in Figure 1, to elucidate specific component themes within each theme.

In the following text, we present these themes along with quotations from students as illustrations.

### **Theme 1: Case-related factors**

#### *Number of cases*

Students indicated that exposure to an adequate number of clinical cases during the clinical rotation is important to the development of their clinical skills.

*"When I see a lot of patients, I learn better. Not only that, but I feel more confident and less stressed in front of patients."*  
SFG3 (Student Focus Group #3)



**Table 1: Examples of students' comments in each theme**

Theme	Examples of students' responses
Authenticity of experience	Seeing patient from A to Z Integrated experience (patient as a whole) Realistic Patient-centered approach Writing in patient's file Taking responsibility for the treatment of the patient Be a real doctor Being 1 <sup>st</sup> contact to patient Work as a real doctor Application of knowledge Doing things myself
Case- related factors	Many complaints Varieties of cases Different presentation of cases Unusual presentations New cases Positive signs
Organization of teaching	Preparation before the clinical encounter Reading after the clinical encounter Wrap-up at the end of the clinical encounter Share experience with other students and invite others to share their experience Elective rotations Taking enough time for the patient Good learning environment
Supervisor's factors	Supervisor's communication skills Respect by supervisor Commitment of the supervisor Good relationship with supervisor Positive attitude (supervisor) Good feedback
Skills of learning	Know own limitations Practice evidence-based medicine keep up to date. Show confidence (express yourself) Positive attitude to learning Self-readiness to the teaching session Enjoy while learning

**Variety of cases**

Another aspect of the clinical cases students encounter is the opportunity to be exposed to different clinical pathologies and presentations. One student commented:

*"In family practice, patients usually come in with many complaints, not only one, I mean many clinical problems. This is very useful, as I can learn how to organize these problems, how to give priorities and how to deal with each one of them in a logical way."* SFG1

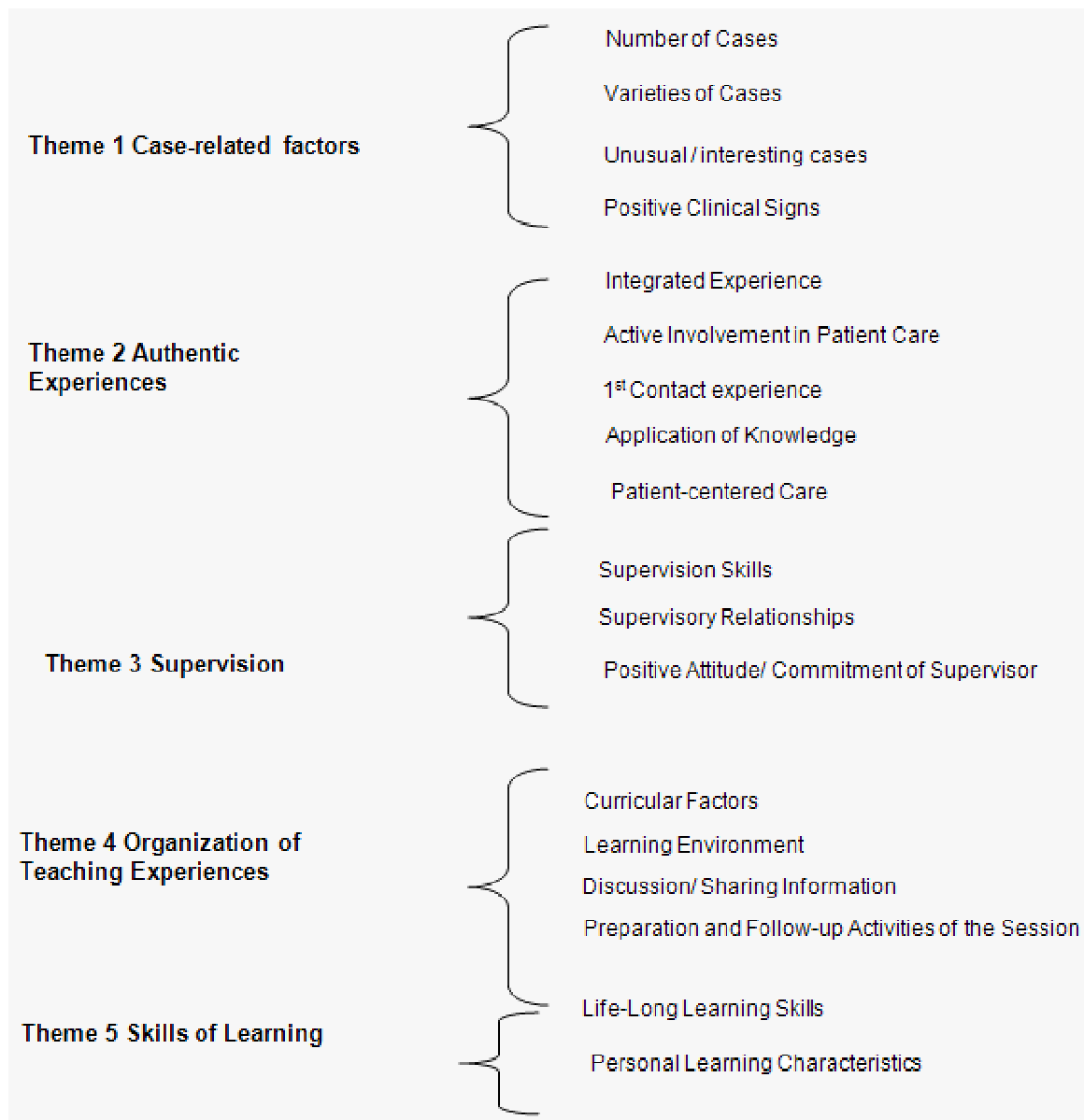


Figure 1: Themes and sub-themes

*Unusual/interesting cases*

Students felt they learned better when they found that the clinical case they encountered was stimulating and rare.

*"I met a patient who came to the Emergency Room with recurrent chest infections. He was later diagnosed with lung cancer. It was striking for me and the patient. I learned to be more cautious in certain situations. SFG2*



### ***Positive clinical signs***

Students found the positive clinical finding in patients was another factor that enhanced clinical development.

*"Sometimes, I approach my colleagues and ask them if they have seen patients with abnormal signs. This is useful, as we usually don't encounter all important abnormal signs in one clinical rotation." SFG2*

## **Theme 2: authentic experiences**

### ***Integrated experiences***

Students perceived that effective clinical experiences were those that were comprehensive and meaningful to them.

*"Seeing patients from A to Z is very beneficial. I mean performing all the necessary things for the patient when he presented in the clinic. Starting with greeting him, introducing ourselves, taking history, doing the physical examination, counseling him, and discussing all different issues with the patient. This type of integration really increases our confidence." SFG1*

*"Practice in general clinics allows us to see many patients with varieties of clinical presentations. We are not restricted to a single system or a specialty." SFG1*

### ***Active involvement in patient care***

Active involvement in the patient's care is perceived as factor that stimulates students to learn better in the clinical setting.

*"Sometimes we learn by joining the team during rounds, but the amount that we learn is usually minimal." SFG2*

Staff or consultants may need to encourage students' active involvement, as was mentioned by a student:

*"I think what really encourages me is the enthusiasm of the consultant to actively involve me, as a medical student in the ward round." SFG1*

### ***First contact experiences***

If they are allowed to be the first member of the team to evaluate the patient, students perceived that this makes the patient encounter more authentic and that it contributes positively to their learning.

*"If I am the first individual to meet the patient, take their history, perform the physical, then present the case to the senior staff, this will encourage me to behave as a real doctor, and I will be requested to provide the first evaluation of the case." SFG1*



### ***Application of knowledge***

Students believed that the opportunity to apply previously acquired theoretical knowledge during their encounter with patients enhances clinical learning.

*"When I apply what I know, or share it with patients, this reinforces my knowledge. If I learn that exercising three or four times per week will improve blood sugar control for diabetics, applying this by discussing it with patients makes it stick in my mind."* SFG2

### ***Patient-centered care***

Clinical experiences involving aspects of patient-centered care was perceived as another feature that promoted clinical learning.

*"Discussing clinical issues with the patients and involving them in the process of management by expressing their ideas and concerns allows us to practice patient-centered care. This is very beneficial for us and the patients. It also develops our confidence as well."* SFG3

## **Theme 3: Supervision**

### ***Supervision skills***

Students perceived that supervisors should have certain teaching skills to facilitate students' learning in the clinical environment.

*"Sometimes the clinical supervisor does not have enough experience in providing feedback. They are doing their best, but actually that does not help me a lot to achieve my goals."* SFG2

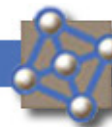
*"I remembered that once I received some good feedback. The supervisor was relaxed, using simple terms, and his message was clear. I felt that the supervisor really wanted to help me."* SFG3

### ***Supervisory relationship***

Students also felt that a good student-teacher relationship facilitates students' learning and stimulates their involvement in the learning process.

*"I noticed that when I was attached to an individual consultant, after some time he or she will get better acquainted with me and start to recognize my strengths and weaknesses, thus resulting in a good relationship."* SFG3

### ***Positive attitude/Commitment of supervisors***



The supervising teacher's commitment to the teaching activities was thought to be another important and encouraging factor. Moreover, students thought that it was important for teachers to have a positive attitude towards them and the teaching process.

*"If the consultant deals with me respectfully, I feel more comfortable and will be willing to learn and participate in the discussion. But if I feel that I am not respected by the supervisor, I will not feel comfortable and wish to finish the rotation quickly."* SFG1

#### **Theme 4: Organization of the teaching session**

##### ***Curricular factors***

Students perceived that their involvement in the planning process of the teaching policies and activities stimulated them to learn better.

##### ***Learning environment***

A good clinical learning environment was also perceived as an important factor in learning.

*"If the environment is healthy, I learn better. I mean if there is enough time, no rush and the teacher is willing to teach."* SFG2

##### ***Discussion / Sharing information***

*"One way to improve clinical competence is to share what you learn in the clinic with your colleagues. I found this very useful."* SFG1

##### ***Preparation and follow-up activities of the clinical session***

Students thought that they gained more when they came to the session well-prepared, both mentally and physically.

*"During the rotation, we had study sessions in which we would review a topic, like diabetes or hypertension. This was helpful for us during our training as we would apply what we had learned."* SFG1

*"We should not let our life and personal situations affect our readiness to learn from clinical sessions. I think we need to be prepared and come ready, so we can learn better."* SFG2



**Theme 5: Skills of learning**

*Life-long learning skills*

Students perceived that clinical learning is a life-long learning process, which requires students to be independent learners with an attitude to seek the required knowledge and skills for their clinical responsibilities. One ambitious student (SFG2) stated that he always carries a notebook to write down things that he doesn't know or needs to learn more about. Through this he learns more and less often forgets.

*Personal learning characteristics*

Students perceived that their personal characteristics and skills were important to their learning. Such characteristics include having a positive attitude towards learning, showing confidence, and being comfortable hearing contradictory comments from various teachers.

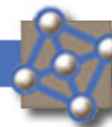
*"Doctors know everything! This is completely wrong. As human beings, we have limitations in our knowledge and abilities. Therefore, I do not feel hesitant or ashamed to ask about something that I do not know, from any person, whether another doctor or a nurse. I tried this and found it very beneficial." SFG2*

*Teacher focus group interview*

Analysis of the teachers' responses revealed that their views related to only three issues: (1) Organization of teaching experiences, (2) Authenticity of the learning experience and (3) Supervisory factors (Table 2).

**Table 2: Examples of teachers' comments in each theme.**

Theme	Examples of teachers' responses
Organization of teaching	Make objectives realistic and practical Alignment of objectives to training and assessment Involvement of students in clinics, meetings, research Feedback from student Faculty development Use of other sites (ambulatory care, community hospitals) Culture: change the educational culture Teaching environment Proper curriculum designing and planning of contents Content should be interesting for students
Supervisor factors	Feedback; frequent and at short distances Positive attitude of teachers Provision of role models Respect of students Balanced approach; neither too nice nor too hard Feedback should be developed and implemented Interested teachers/supervisors
Authenticity of experience	Involvement of students: skills labs, simulation learning in context ; active involvement Assignments Simulations (because of lack of real patients compared to the big number of students) Working with patients and their families Real doctor feelings and experiences



### Organization of the teaching experiences

Teachers perceived that to be effective, teaching sessions should be carefully organized, with clear objectives, proper alignment of the various curricular components, and proper implementation.

*"The problem is that students come to the clinical rotations with very high expectations. This arises from the stated objectives in the curriculum. They are faced by a number of difficulties and limitations which hinder them from achieving the stated objectives. Therefore, the objectives have to be clear, practical, more realistic, and easier for students and teachers to implement."*

Teachers noted the effect that clinical culture has on learning. The effect of culture was noted to involve both students and teachers, and was perceived to be particularly important in certain aspects of clinical learning and teaching and on giving feedback.

*"The most important thing to improve is our feedback. In fact, a major factor in clinical training is to change the educational culture."*

### Supervisor factors

Teachers perceived that learning is enhanced if supervisors are interested and have good teaching and communication skills.

*"If the supervisor is not interested and has little teaching experience, students will never learn. Actually, they will get depressed and will not like it."*

*"I found it useful if I give my student time to reflect at the end of each clinical session and summarize what she or he has learned. I ask my student to think for a minute and to tell me three new things he or she learned during the clinical session."*

### Authenticity of experience

Issues related to how clinical teaching is delivered were thought to be important to students' learning. These include having students be actively involved, allowing them to work with patients and families, and allowing students to work as a "real doctor".

*"Offering clinical sites in other than hospitals could be very beneficial for students. If students are sent to community centers, they will have a lot of clinical opportunities. More common clinical problems will be encountered, they will be dealing with patients and their families, and competition for cases will be much less. They will learn better than in tertiary and specialized hospitals."*



## Discussion

This study aimed to explore medical students' and teachers' views of the types of experiences and activities that contributed to students' clinical competence. The features of clinical training experiences that dental students perceived were effective<sup>12</sup> were quite similar to those perceived by our study's medical students. Our students perceived that authentic clinical experiences are important to their clinical learning, allowing them to see the patient as a whole, be the first medical contact for the patient, take more responsibility of their own learning and apply patient-centered care. Similarly, prior studies have found that students perceive they learn better if they have some amount of control, take responsibility for their learning and patients, are encouraged to gain the whole picture of patients' issues, and participate in patient-centered care<sup>13-15</sup>.

Applying these concepts contributes to the development of an appropriate attitude towards patients and promotes student motivation and confidence<sup>16</sup>.

Students also identified the importance of the scope of clinical cases they saw in terms of numbers, variety, offering varied clinical signs and unusual and interesting cases. Previous studies have demonstrated that clinical volume helps students gain clinical skills<sup>17</sup> and that it is patient variation found through the volume of clinical experiences that is important<sup>6,18,19</sup>. Volume of encounters is particularly important in learning the diagnostic process, which benefits from learning proper history and physical examination skills through repetition.

These students identified several organizational factors as important to their learning, but the impact of factors like number of students and space in rotations has not always been found to affect learning<sup>18</sup>. Our students also felt that the learning environment contributes to their learning, as has been emphasized in the literature<sup>20</sup>.

Our students also felt that their teachers' positive attitudes, commitment to them, ability to establish a good supervisory relationship, and good teaching skills were important to learning. Quality supervision has been reported as a determinant of clinical students' learning<sup>7</sup> and good quality supervision can compensate for other insufficiencies in the learning situation, such as inadequate patient variety<sup>6</sup>.

It has also been shown that both students and teachers value good feedback in clinical teaching and learning<sup>17,21</sup>, and that good feedback directly influences students' performance<sup>5</sup>. Others have previously reported that teachers are more effective when they show a positive attitude and enthusiasm for teaching, demonstrate good clinical skills, and practice ethically<sup>22,23</sup>.

Teachers in this study perceived that various organizational issues affected students' learning, including issues relating to the curriculum and the teaching environment. Like students, teachers also noted the importance to learning of how teaching activities are organized, the quality of supervision, and authenticity of the clinical experiences. Interestingly, although both groups noted issues in these three areas, they focused on somewhat different sides of these issues. Students emphasized these features as they related to how the clinical teaching activities were executed, i.e., how they affected the actual learning environment, whereas teachers emphasized how these features related to activity planning.

Students identified two issues that teachers did not report, relating to aspects of the clinical cases and the importance of students' skills as learners. The difference between the perceptions of students and teachers may reflect their respective priorities, with students more concerned about having adequate clinical exposure and better recognizing their own strengths and weaknesses as



learners, whereas teachers are naturally more concerned about the factors they are responsible for in creating the learning environment.

## Conclusion

This study has identified the factors that students and teachers of our medical school believe affect clinical learning. These factors can be considered when planning and developing medical curricula, to promote effective clinical rotations and students' learning.

It should be noted that this study queried perceptions, and relying on only subjective assessments and personal views and experiences cannot confirm or quantify the impact of each factor identified. Further studies using other, complementary study approaches should assess the impact of the factors identified by the students of this study.

## References

1. Murray E, Jolly B, Modell M. Can students learn clinical method in general practice? A randomized crossover trial based on objective structured clinical examinations. *British Medical Journal*. 1997; 315(7113): 920-923.
2. O'Sullivan M, Martin J, Murray E. Students' perceptions of the relative advantages and disadvantages of community-based and hospital-based teaching: a qualitative study. *Medical Education*. 2000; 34(8):648-655.
3. Vosti KL, Bloch DA, Jacobs CD. The relationship of clinical knowledge to months of clinical training among medical students. *Academic Medicine*. 1997; 72(4):305-307.
4. MacManus IC, Richards P, Winder BC, Sproston KA. Clinical experience, performance in final examinations, and learning style in medical students: prospective study. *British Medical Journal*. 1998; 316(7128): 345-350.
5. Kliminster S, Cottrell D, Grant J, Brian J. Effective educational and clinical supervision. *Medical Teacher*. 2007; 29(1): 2-19.
6. Dolmans DH, Wolfhagen HAP, Essed GG, Scherpbier AJ, Vleuten CP. The impact of supervision, patient mix, and numbers of students on the effectiveness of clinical rotations. *Academic Medicine*. 2002;77(4):332-335.
7. Wimmers PF, Schmidt HG, Splinter TAW. Influence of clerkship experiences on clinical competence. *Medical Education*. 2006; 40(5):450-458.
8. Hollway I. *Basic Concepts for Quality Research*. London. Blackwell science Ltd; 1997.
9. Rabiee F. Focus-group interview and data analysis. *Proceedings of the Nutrition Society*. 2004; 63(4):655-660.
10. Pope C, Ziebland S, Mays N. Analysing qualitative data. *British Medical Journal*. 2000; 320(7227): 114-116.
11. Sharts-Hopko NC. Assessing rigor in qualitative research. *Journal of the Association of Nursing in AIDS*. 2002; 13(4):84-86.



12. Victoroff KZ, Hogan S. Students' perception of effective learning experiences in dental school: a qualitative study using a critical incident technique. *Journal of Dental Education*. 2006; 70(2): 124-132.
  13. Kalet, A, Schwartz MD, Capponi, LJ, Mahon-Salazar C, Bateman WB. Ambulatory versus inpatient rotations in teaching third-year students internal medicine. *Journal of General Internal Medicine*. 1998; 13(5):327-330.
  14. Lofmark A, Wikblad K. Facilitating and obstructing factors for development of learning in clinical practice; a student perspective. *Journal of Advanced Nursing*. 2001; 34(1): 43-50.
  15. Murray E, Alderman P, Coppola W, Grol R, Bouhuijs P, van der Vleuten C. What do students actually do on an internal medicine clerkship? A log diary study. *Medical Education*. 2001; 35 : (12) 1101-1107(12) 1101-1107
  16. Littlewood S, Ypinazar V, Margolis SA, Scherpbier A, Spencer J. Early practical experience and the social responsiveness of clinical education: systemic review. *British Medical Journal*. 2005; 331(7513):387-91.
  17. Rolfe IE, Sanso-Fisher RW. Translating learning principles into practice: a new strategy for learning clinical skill. *Medical Education*. 2002; 36(4):345-352.
  18. Dolmans DH, Wolfhagen HAP, Essed GG, Scherpbier AJ, Vleuten CP. Students' perceptions of relationships between some educational variables in the out-patient setting. *Medical Education*. 2002; 36(8):735-741.
  19. Chatenay M, Maguire T, Skakum E, Chang G, Cook D, Warnock GL. Does volume of clinical experience affect Performance of clinical clerks on surgery exit examinations? *American Journal of Surgery*. 1996; 172(4):366-372.
  20. Irby DM. Teaching and learning in ambulatory care setting: a thematic review of the literature. *Academic Medicine*. 1995;70(10):898-931.
  21. Lawrence SL, Lindemann JC, Gottlieb M. What students value: learning outcomes in a required third-year ambulatory primary care clerkship. *Academic Medicine*. 1999; 74(6):715-717.
  22. Elnicki DM, Kolarik R, Bardella I. Third- year medical students' perceptions of effective teaching behaviors in a multidisciplinary ambulatory clerkship. *Academic Medicine*. 2003; 78(8):815-819.
  23. Buchel TL, Edwards FD. (2005). Characteristics of effective clinical teachers. *Family Medicine*. 2005; 37(1): 30-35.
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