

Review Article

Effective Learning Strategies in The Emergency Department for Medical Students

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Abstract

Clinical learning in the emergency department is one of the rotations carried out by medical students in the medical education program. Learning in the emergency department can help students fulfill their competence in emergency clinical skill, such as basic life support, management of acutely ill patients and some other competencies. However, the emergency department has some limitations, such as the variety of professionals and students serving the patients, various diseases with varying levels of severity, as well as the unpredictable condition and number of patients. Those reasons make it difficult for students to study and practice emergency medicine well. Therefore, clinical educators' awareness of the conditions in the emergency department and the application of appropriate learning models will enable students to get the best learning experience in the emergency department.

Keywords: emergency, clinical learning, medical education.

Strategi Pembelajaran Efektif di Lingkungan Pelayanan Gawat Darurat pada Peserta Program Pendidikan Dokter

Abstrak

Pembelajaran klinis di departemen emergensi adalah salah satu rotasi yang dijalankan peserta program pendidikan kedokteran. Pembelajaran di departemen emergensi membantu peserta didik untuk memenuhi kompetensi klinis di bidang emergensi seperti bantuan hidup dasar, manajemen pasien sakit akut, dan kompetensi lainnya. Namun, departemen emergensi memiliki keterbatasan seperti keberagaman profesi dan peserta didik yang melayani pasien, berbagai penyakit dengan tingkat keparahan yang bervariasi, serta jumlah dan kondisi pasien yang tidak dapat diprediksi. Hal tersebut membuat peserta didik kesulitan untuk belajar dan mempraktikkan ilmu emergensi dengan baik. Oleh karena itu, kesadaran pendidik klinis terhadap kondisi di departemen emergensi dan penerapan model pembelajaran yang tepat akan memungkinkan siswa mendapatkan pengalaman belajar terbaik.

Kata kunci: emergensi, pembelajaran klinis, pendidikan kedokteran.

Introduction

Learning in the clinical setting is an essential part of medical education. It can be said that the success of the clinical learning process will determine the quality of doctors resulting from medical education. A doctor's clinical skills, communication skills, and professionalism are actually obtained when undergoing clinical learning. In contrast to learning at the academic stage, the teaching and learning process in the clinical setting requires a special approach because of the special characteristics of its situation as well as interactions between students and patients,¹ including the emergency department. Students must also undergo clinical learning in the emergency department which is primarily prepared for prompt and appropriate health services. The learning process in the emergency department must take place in a limited time, and rapidly changing situations are unpredictable, thus it is difficult to arrange a learning program.

Clinical learning in the emergency department is a stage that all medical students must go through. Referring to the National Standards for the Indonesian Medical Professional Education (SNPPDI), it can be seen that there are quite a number of doctor's competencies related to health problems, diseases, and clinical skills from various fields of science whose clinical experience can only be obtained by learning in the emergency department. Those competencies are the management of pneumothorax, rib fractures, spontaneous abortion, and vulnus laceratum, all of which have competency level 4 which means medical graduates must be able to diagnose and treat the patient thoroughly.²

In fact, the medical learning curriculum still varies widely between institutions. Currently, at our institution, clinical learning in the emergency department is still focused on fulfilling the requirements of the clinical modules being undertaken by certain medical departments, without any emergency learning objectives. Therefore, there may still be a diversity of clinical skills in handling emergency cases by graduate students. Even though the existence of an emergency module will make learning objectives clearer related to emergency science, such as basic life support skills, management of patient acute complaints, and others.³ Furthermore, the existence of an emergency module can present and strengthen a valuable clinical experience for students.⁴ In America, this system has been implemented in its institution, which has integrated

emergency medicine in the medical curriculum taught by clinical educators from the emergency department by implementing a rotation in the emergency services.⁴

Apart from the implementation of emergency science education carried out by each institution, clinical learning in the emergency department has its own specialty. The emergency department consists of various professionals and students at multiple stages. Moreover, the number of patients is very unpredictable, from zero patients to overcrowded situations, limited face-to-face time with patients along with interruptions in patient care. The clinical educators, and also health workers in the emergency department, are often faced with cases that require immediate management, ensuring a good quality of service, and ensuring the flow of patients while carrying out their role as educators.^{5,6}

There has been a lot of literature reviewing on the clinical learning of medical education programs in outpatient and inpatient services, but not much has been discussed about learning programs in the emergency department. This article is structured to review more deeply about the clinical learning strategies of participants in the medical learning program in the emergency department to be effective, considering all the challenges in the emergency department.

Learning Process in The Clinical Setting

Clinical learning is a special thing that is only found in the learning of health workers, including in medical education. This absolutely must be passed by a doctor. In this study, students are required to be able to implement the knowledge and things they have acquired at the pre-clinical stage. Therefore, communication skills between professionals play an important role in determining the success of clinical learning which will affect the success of a student to become a good doctor.¹

In general, clinical learning with patients has many benefits, students can learn in real conditions, get a chance to practice role-modeling, get opportunities to master skills, increase student motivation, improve thinking skills professionally, and get opportunities to integrate clinical skills, communication skills, problem-solving skills, decision making and ethical issues.⁷ Particularly, clinical learning in the emergency department offers a special learning experience that differs from outpatient and inpatient situations. In this situation, students can encounter various kinds of diseases and their severity, from patients of very

diverse ages.³ In this setting, students can also apply the knowledge and clinical skills that have been received from various rotations undertaken previously such as internal medicine, surgery, pediatrics, and others.⁸ However, learning in the emergency setting also has some challenges. This department consists of health professionals and students with multiple levels. In addition, from the point of view of the patient's condition, the number of patients is very unpredictable, limited face-to-face time with patients along with the possibility of interruptions in patient handling that must be done immediately so that this is not an easy thing for students, especially a freshman. The educators who are concurrently health workers in the emergency department often have long working hours, deal with cases that require immediate management, has the obligation to ensure the service quality, and ensure the flow of patients while carrying out their role as educators.^{5,6} The consequence of this is a need for a balance between continuity of care for patients, clinical learning, and creating a learning experience for students according to their levels.⁶

A study in an emergency department in Australia found that the three things considered the most obstacles to the learning process in the emergency department by students were concerns about evaluations by educators, a crowd in the department, and time management. Meanwhile, the obstacles found by educators based on the priority scale are slightly different, sequentially, a crowd in department, time management and the difficulty of getting patients according to plan.⁸

Clinical Learning Models

A plan of clinical learning, especially learning that must take place in a short time in emergency services, is very important to balance the portion of patient care and the learning process of students. Therefore, a well-planned learning program will be able to produce worthwhile experiences or skills for students.⁶

There are two general learning models in clinical settings used to ensure optimal learning takes place, namely the *Stanford Model* and the *One-Minute Preceptor Model*. In general, the Stanford model states that overall learning is classified into seven categories, starting from building a positive learning vibe, controlling learning sessions, communicating learning outcomes, emphasizing the understanding of definition and knowledge retention, student evaluation and providing feedback, and encouraging independent learning.

One-minute preceptor (OMP) or known as micro-skills teaching, is made to carry out learning in a short time. This is considered to be applicable to learning in emergency services.⁹ It consists of 5 steps:

1. Get Commitment
In this step, the clinical educator asks students about the diagnosis/therapy that will be given to the patient at hand. It is expected that by getting this question, students can analyze the data obtained in the previous examination and use reasoning to answer the teacher's question.
2. Excavating supporting data according to the answer of the first point
In this step, the teacher stimulates students to convey the reasons for establishing the diagnosis in the first point. Then the teacher responds and validates the reasons.
3. Teach the basic principles of the patient's disease
At this point, the educator conveys the basic principles of the patient's condition/disease. So that it can be a basis for students when they find the same condition/disease.
4. Give positive feedback
Confirming the correct answers that have been submitted by students
5. Give negative feedback
Submit corrections for errors submitted by students.

Apart from the 2 clinical learning models above, there are several other clinical learning models such as SNAPPS (summarize, narrow, analyze, probe, plan, and select), MiPLAN (meeting, introduction, in the moment, inspection, interruptions and independent thought, patient care, learner's questions, attending's agenda and next steps) and others. Each clinical learning model has its own uniqueness and requires varying readiness between students and clinical educators. Among the several clinical learning models, there are two clinical learning models that can also be used for emergency service situations, they are SNAPPS and Emergency Department Strategies for Teaching Any Time (ED STAT!)⁷

The SNAPPS learning model aims to strengthen the diagnosing students' ability and way of thinking students with a dynamic style. Unlike the OMP method which learning is directed by the teacher, this method is student-centered and self-directed. This learning model requires better preparation compared to OMP, so it is generally

carried out on more senior students.⁷ A study in Japan that compared the two learning models found that SNAPPS was better at bringing up things that were still unclear to students and getting a more positive assessment from the OMP.¹⁰ Things or a diagnosis that is not clear are considered a good trigger for students to think critically. The six stages of the SNAPPS learning model are:

1. Summarize
Students present the important points of the patient's medical history and clinical examination briefly.
2. Narrow
Students make the composition of the differential diagnosis limited to 2-3 differential diagnoses.
3. Analyze
At this stage, students discuss each differential diagnosis by comparing positive and negative data from patients.
4. Probes
This is a specific step in the SNAPPS model. Unlike the OMP model, the students are asked to ask questions themselves that are still doubtful, to fill gaps in students' nescience.
5. Plan
Discuss patient management plans, led by students, using educators as a source of information.
6. Select
Closing the learning session with activities that are also directed by the students themselves, to strengthen the principles that exist during learning. It can take the form of discussing scientific articles, listening to podcasts, etc.

ED STAT! was developed by Sherbino et al⁷ in 2006. This model was developed due to the lack of discussion regarding good learning models for use in emergency departments. ED STAT! is an acronym for the 6 stages in this model, with the first 2 stages being carried out at the initial meeting of students and educators, and the next 4 stages at the first meeting. The stages are:

1. Expectations
This is the initial stage of introduction to the emergency department. Each educator and student express expectations for this learning,

so it is hoped that the learning atmosphere will be better.

2. Diagnose the Learner
At this stage, educators seek to explore further about the level of understanding of students. This can be done by asking what types of cases are considered the most interesting or asking what kind of feedback the students expect during the learning process.
3. Set Up
This is the stage where educators first prepare scenarios, which can then be used as triggers to discuss teaching materials.
4. Teach
At this stage, educators are expected to use strategies for effective learning. Learning points must have a broad target (high yield), be concise, relevant to students and can be generalized to various similar cases. If any patient has interesting clinical/physical examination findings and the consent is obtained, gather students for active bedside learning.
5. Assess and Give Feedback
This stage is the stage of providing non-judgmental feedback, which is based on the results of direct observations during the learning process. Educators can also involve students to conduct an assessment of themselves, which can also be used as input for educators.
6. Teacher Always (Role Model)
This is the stage where the teacher is a role model for students. Thus, educators must pay close attention to body language, word choice, and non-verbal communication.

In this learning model, the learning process is still centered and directed by educators, starting from the expectation to the final stage, to continue to be a role model for students. Learners play a more passive role in following directions and paying attention to educators, both words and behavior. The advantages of the ED STAT are specifically designed for learning in emergency services and there has been no other learning method like this before. However, this model has just been introduced so it may still need some improvements.

Table 1. Summary of Clinical Learning Model Comparison⁵

| Models | Learning Stages | Advantages | Disadvantages |
|--------------------|---|---|---|
| OMP or Microskills | <ul style="list-style-type: none"> - Get a commitment - Probe for supporting evidence - Teach general rules - Reinforce what was done right - Correct mistakes - Identify next learning steps | <ul style="list-style-type: none"> - Most studied - Student-centered, only directed by educators - Easy to learn - Teaching a learning concepts at a higher level - Linking clinical learning and patient care - Using feedback | Not suitable for critical conditions or resuscitation |
| SNAPPS | <ul style="list-style-type: none"> - Summarize - Narrow - Analyze - Probe - Plan - Select | <ul style="list-style-type: none"> - Student-centered and the process is student-directed - More interaction between students and clinical educators | Training is needed for educators and students |
| ED STAT! | <ul style="list-style-type: none"> - Expectations - Diagnose the learner - Set-up - Teach - Assess and give feedback - Teacher always (role model) | <ul style="list-style-type: none"> - Specially designed for emergency department | Training is needed by educators |

From the learning models above, it can be seen that aspects of student commitment, student identification, giving positive and negative feedback, as well as being role models for students are important things. The method that is often used in clinical learning is bedside teaching. This learning method involves a "learning triad", educators, students and patients. Thus, it is generally carried out in a clinic, but it is possible to do it in the emergency department with some adjustments. This method is a specific method found in clinical learning and involves interaction with patients. The presence of patients is believed to increase student motivation.¹¹

Ramani¹⁰ in 2003 described 12 stages to optimize the bedside-teaching learning which are:

1. Preparation

Preparation is key to creating an effective and comfortable bedside round. Including preparation for knowing students and for improving teaching skills, taking history, clinical examination and problem solving.

2. Planning

Make a plan regarding what students are expected to get after undergoing bedside teaching.

3. Orientation

Discuss with students about lesson plans and learning objectives.

4. Introduction

Introduce yourself and the group of students present to the patient and create a learning atmosphere.

5. Interaction

Clinical educators must be able to provide examples (become role models) to related students, professionalism, verbal and non-verbal language to patients.

6. Observation

Clinical educators make observations on communication skills, ability to take anamnesis, examination and problem solving abilities, level of knowledge and behavior of students.

7. Instruction

Carry out instructions to students without embarrassment, correct mistakes properly, teach professionalism, avoid boredom, and take advantage of moments that can be used for teaching.

8. Summary

Do a summary before leaving bedside, according to what has been learned during the lesson. Patients also need a summary of what has been discussed as well as patient education.

9. Debriefing

This stage takes place outdoors, unnoticed by the patient. This stage is carried out for sensitive matters related to patient history, differential diagnosis, and for opportunities to ask questions to students.

10. Feedback

Do positive and negative feedback. It can also be done by students by giving feedback

to themselves. This stage should be short and focused. This will improve the quality of the next round of bedside teaching.

11. Reflection

This is done by clinical educators after completing the stages of observation, debriefing, and feedback. This is done so that educators know their strengths and weaknesses when teaching bedside and correct them on the following occasions.

12. Preparation for the next session

Based on the results of the reflection in the previous stage, make improvements to improve the quality of bedside teaching, and create a more pleasant atmosphere in the next lesson.

Ngo¹ generally divides the bedside teaching stages above into 3 stages, namely pre-round (preparation, planning, orientation), round (introductions, interactions, observations, instructions and summaries) and post-round (debriefing, feedback, reflection). and preparation). It is in the implementation of the pre-rounds and post-rounds stages that the previously mentioned learning model can be applied. Such as the application of the SNAPPS learning model at the post-round stage.

The emergency department is actually the right place to carry out bedside teaching because of the large number of patients and varied cases.¹² However, the condition of the emergency department which is often crowded makes it difficult for conducive bedside teaching to take place. In addition, the bedside teaching method has also been avoided by many clinical educators because of various obstacles that may be encountered with patients such as refusal.¹³ According to a study by Celenza and Rogers, sufficient teaching staff and a well-planned learning program are needed for the assignment of educators and students to the implementation of effective bedside teaching in the emergency department.⁸

Other than bedside teaching, rounds conducted by clinical educators/medical staff in the emergency department can be used as an opportunity to provide education while carrying out services to patients.³ Whether rounds that are carried out while walking along the patient's place (bedside) or rounds that are only carried out at the hospital in front of the patient list board.³ This round activity while walking around the patient is considered interesting by students.

Procedural Skills Learning

Procedural skills are skills that are learned to be mastered by students and are needed in the process of establishing a diagnosis and providing therapy in the realm of medical practice. This learning must be carried out in a structured and effective manner without endangering patient safety. Learning procedure skills in clinical learning has its own challenges, such as challenges in maintaining patient safety aspects, challenges in learning complex procedures, challenges of limited time in teaching students and challenges in the transfer process of these procedural skills.¹⁴ The emergency service environment is one environment that has a lot of potential for the implementation of procedural skills by students. Therefore, it is important to properly prepare students' procedural skills before entering the emergency service environment.

In general, procedural skills training can use the 5-step model as stated by George and Doto.¹⁵ The steps include 1) general summary, 2) demonstration by the instructor without verbal explanation 3) procedure narration by the instructor, 4) verbalization of the procedure by students, and 5) the practice of skills by students. Implementing this 5-step model in the emergency department may have difficulties because most of the patients are in acute clinical condition and in an uncontrolled environment. Therefore, it should be done using mannequin that can imitate emergency situation.

The use of simulation is one of the methods in procedural skills training. Simulation methods are currently increasingly popular because they can reduce the risk to patients and training is now more standardized.¹⁴ Medical scenarios play an important role in conducting simulations. However, before carrying out the simulation, a well-prepared program must be made, including the preparation of a clear scenario, and the learning objectives to be achieved must be clear. The scenarios studied must be realistic and the teacher can master simulator technology. The simulators that are commonly used are resuscitation simulators and even simulators that are fully human.¹³

The Role of The Clinical Educator

Clinical educators have a crucial and complex task because they play an important role in the success of medical education learning. As is well known that medical education is a different system from learning other disciplines. Harden and Crosby

in 2000 described the role of clinical educators as shown in Table 2. Clinical educators must also play a role in providing support, guidance and supervision to students in undergoing the process

of forming a professional person. Spencer¹⁶ said that clinical educators can optimize their function by planning lessons and using appropriate questioning techniques in learning.

Table 2. The Role of The Clinical Educator According to Harden and Crosby

| Requirements | Roles | Actions |
|---|--------------------|--|
| Require more educational expertise | Examiner | Planning or participating in student exams Evaluating curriculum |
| | Planner | Curriculum planner Course director |
| | Resource developer | Study guide Developing resource materials in the form of computer programs, videos or print |
| Require more content expertise or knowledge | Informant | In-class teacher Clinical or practical teacher |
| | Role model | Being a role model at work Being a role model in teaching |
| | Facilitator | Tutor Facilitator in the learning process |

A good clinical educator is described as an enthusiastic individual, who always plans activities well and clearly and interacts well with students.⁵ In general, there are slight differences in characteristics with clinical educators who work in the emergency department. This is due to differences in the learning environment and time constraints that are addressed to students. Thus, clinical educators in the emergency department must be effective and efficient in carrying out the learning process. For this reason, tips are needed so that learning in the emergency department is successful. The tips for clinical educators needed to make the specific learning process in the emergency department successful are⁵:

1. Get to know students personally

Learning will be more optimal if educators recognize their students. It means knowing their name, level of education and level of understanding, especially in the aspect of emergency services. In addition, educators also convey goals and expectations after participating in this lesson. Thus, between educators and students, there is a common perception of learning. Another thing that needs to be done is to emphasize what will be learned before starting the guard shift. For example, today's shift focuses on the patient's history, while the next shift will focus on establishing the patient's diagnosis. This will make learning more effective and efficient.

2. Disseminate learning to students

Learning socialization is inseparable from the orientation of things related to learning to students. This includes place orientation, service flow, and learning systems that will make the learning process faster and optimal.

3. Take advantage of the moment when an interesting case is found and discussed immediately. If there are some interesting cases found, educators can directly discuss them with students. Of course, this is done after the patient's emergency is resolved. Discuss the case by providing stimuli to students and try to make all members of the group actively discuss. In addition, educators should provide positive feedback so that students know how to handle such cases if they are encountered in the future.

4. Expose to interesting and rare cases

This can be done by presenting the case documentation to them. Provide interesting statistics during discussions to increase student retention.

5. Improve and maximize time efficiency

This can be applied by delegating senior students and other trained emergency room staff to assist learning, especially in matters related to the skills of the students. By applying this method, besides students gaining knowledge and skills, they will also

gain experience in communicating with health professionals.

Conclusion

Clinical learning in the emergency department is an important learning process for medical education participants and has many benefits, but is unique with various obstacles. For this reason, it is important to determine the right clinical learning model. The "One-Minute Preceptor Model" can be used as well as the ED STAT! model. In addition to determining the right learning model, it is also important to implement several teaching strategies for educators. Some important strategies for educators to do are trying to get to know their students (related to expectations and level of knowledge), involve students actively, take advantage of the moment especially when interesting cases are found, be efficient in using time and realize their role as a role model for students. Besides determining appropriate learning methods and using appropriate teaching strategies for educators, curriculum preparation and integration of emergency science in the medical education curriculum can affect the clinical abilities obtained by students. Therefore, it is necessary to consider having a separate emergency service module.

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