

Improving the skills training of the junior medical students can junior medical students attain a comparable skills competence to senior students?

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Abstract

Context: The system-based curriculum adopted at Alzaeim Alazhari University (AAU) (Sudan), entails integration of basic sciences, clinical knowledge and skills training during preclerkship period. **Aim:** The aim of this study was to illustrate how the utilization of the clinical skills laboratory (CSL) may improve the skills acquisition of preclerkship students and be assessed by Objective Structured Clinical Examination (OSCE). **Settings and Design:** clinical skills laboratory of the faculty of medicine AAU For the evaluation of the skills competency of junior medical students a case-controlled design was selected **Subjects and Methods:** All the required tools and materials were prepared. The skills required established. Groups of 10 students attended four sessions of 2 h in the CSL. The skills consisted from different procedural stations. Skills were taught and practiced on manikins, simulated patients and peer examinations. The competency of the junior students and a control group of senior students were evaluated by an OSCE. **Statistical Analysis Used:** The results of the OSCE of the subjects (junior students) and control (senior students) were analyzed using SPSS version 13 as a software. All the values of the descriptive statistical analysis were expressed as percentages (mean $\pm$ standard deviation). $P \geq 0.05$ was considered as significant. **Results:** Junior students scored higher in two procedural stations and the overall score. Senior students obtained higher marks in physical examination and images interpretation stations. Higher scores of junior students in the procedural stations are because they used hands-on skills and senior students learned through observation. **Conclusions:** Junior students trained in the CSL, can attain comparable skills competency to senior students. They can outperform senior students in procedural skills. This confirms that CSL training can improve skills acquisition.

Key words: Alzaeim Alazhari University, clinical skills laboratory, junior medical students, skills training

INTRODUCTION

Skills acquisition is one of the main objectives to be achieved during medical education. The faculty of

medicine of Alzaeim Alazhari University (AAU) follows an integrated system-based curriculum, composed of 10 semesters (each of 18–20 weeks). In each course the basic sciences, clinical knowledge and skills are integrated. The skills' training usually takes place in the teaching hospital, where preclerkship students learn skills by observation, and occasionally they have the opportunity to practice the skills.

The integration of skills training during the early stages of medical education demands early clinical exposure. Students during these early stages are novices, and their learning curve have just started, so a full clinical exposure

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may have a negative effect.^[1] This early clinical exposure is mandatory for achieving integration and it requires a guided clinical environment. Early skills training can be achieved either through an immediate exposure to real patients in clinical environment (which is difficult to arrange most of the time), or through a simulation environment in the clinical skills laboratory (CSL) (which is always available). Students also find difficulty of applying theoretical knowledge in clinical practice. Early skills' training is beneficial and helps to facilitate the transition from theory to practice.^[2]

Skills' training in the CSL allows a student to practice as much as he would like to without endangering the safety of the patient. It helps to build the student's confidence and allows immediate feedback from peers and teachers. In addition, training in the CSL supports theoretical teaching as it overcomes the problems of student embarrassment and the reduced number of patients available for teaching as patients exercise their right to decline to participate in clinical teaching. The lab-based skills training also complements the hospital teaching and assists in motivating students by making learning pleasure able.^[2-5] With careful planning skills, training can be integrated with theoretical teaching and hence that the CSL becomes an educational resource dedicated to ensuring a consistent and high-quality learning experience. Training in the CSL enables students to establish a foundation in skills competency that can be later transferred and refined with real patients.^[3,5]

Junior medical students may feel overwhelmed during their initial clinical exposure when they have to talk and touch patients for the 1st time. Skills training in the CSL helps them to gain confidence before full clinical exposure.^[6-8]

There is potential drawback of early clinical skills training that can be resolved by good planning and selection of teachers and programs. The drawback includes: Lack of a strong foundation in basic sciences makes students unable to understand some of the skills, it may produce some overload on students. It may be associated with reduced opportunities of practicing with real patients, and this may cause students to feel that these sessions are not serious. Lack of interest and enthusiasm of teachers, ill-defined objectives and poorly prepared courses are other potential drawbacks of early skills training in the CSL.^[3,5]

Learning skills by doing in the CSL helps in acquiring skills better than seeing skills done, and learning by observation in hospital, and practicing them at last once, increases students' performance significantly.^[9]

The objectives of the study were to reform the skills training for preclerkship students by implementing the

training within the duration of the course in the CSL and to evaluate the outcome of the training course by an Objective Structured Clinical Examination (OSCE), and answering the study question: Can junior medical students (preclerkship students) attain a comparable level of skills competence to senior medical students (clerkship) in the gastrointestinal module?

SUBJECTS AND METHODS

For the evaluation of the skills competency of junior medical students, a case controlled design was selected. Senior medical students of clerkship were selected as a control (No 49). Junior medical students (No 140) were the subjects. Skills required were established from the objectives of the module and from the literature review. Objectives of each skill, handouts, checklists and teaching videos were prepared. Staff involved in teaching the skills were trained on how to teach in the CSL. The skills required for the module included: Focused gastrointestinal history, abdominal examination, images interpretation, digital rectal examination and naso-gastric tube insertion. Semester five students (No 140), during their studying the gastro intestinal module, were divided into groups of 10 students. Each group attended four CSL sessions each of 2 h to learn and practice the skills required. The skills were taught and practiced on model, manikins, simulated patients and peer examination. The emphasis was on the technique of physical examination and normal finding. Clinical staff (No 6) conducted the sessions and provided feedback for the students. Students had enough time to practice skills and allowed practicing skills out of session time. At the end of the training course the students were assessed by an OSCE of five stations. Forty-nine senior students (clerkship students) were also assessed, as a control group, by the same OSCE. The OSCE stations were: S1 focused history of a simulated patient with abdominal pain, S2 technique of normal abdominal examination, S3 interpretation of a plain abdominal X-ray, S4 digital rectal examination on a model and S5 naso-gastric tube insertion on a manikin. This study was evaluated and approved by the research committee and the faculty board of the faculty of medicine of AAU. The results of the OSCE of the subjects (junior students) and control (senior students) were analyzed using SPSS version 13 (IBM corporation, New York, US) as a software. All the values of the descriptive statistical analysis were expressed as percentages (mean $\pm$ standard deviation). $P \geq 0.05$ was considered as significant.

RESULTS

All the sessions were implemented as scheduled. The attendance of the students was very high no absenteeism.

Both students and clinical teacher were very enthusiastic. The OSCE scores of the junior students in two of the stations (S4, S5) were significantly higher than those of senior students (control group) $P = 0.000$ for S4, and $P = 0.000$ for S5. The senior students (control group) scored significantly higher scores than those of the junior students in S2, S3 $P = 0.032$ for S2, and $P = 0.000$ for S3. In one station (S1) there was no significant difference $P = 0.087$. The total scores of the junior students were higher than those of the senior students $P = 0.026$. Figure 1a and b illustrate the results of the OSCE. Table 1 shows the statistical analysis and the results of OSCE.

DISCUSSION

The present study showed that skills training in the CSL is feasible and effective, both students and staff were enthusiastic.^[6] The study demonstrated that one important objective of the curriculum of the faculty of medicine of AAU (integration) can be implemented in time and successfully by careful planning. Integration requires early skills training and this is possible and can be implemented in the CSL. Expansion of the skills training program, by using the CSL for formal training during the preclerkship will lead to improving the skills competence of junior medical students and helps integrating the skills acquisition in the

deferent modules^[10] All the required skills in the module were taught and practiced in the CSL instead of learning by observation in hospital.

The significant higher scores of the junior students in some of the OSCE station were because they used hand-on the skills. The senior students scored high in the physical examination and images interpretation because they practiced these skills repeatedly during their clerkship rotation, but for the junior students it was the 1st time to learn and practiced the skills. The overall results of the present educational experience demonstrated that junior students outperformed senior students.^[11,12] This finding confirms that CSL training can improve the skills competence of junior medical students when assessed immediately after training and it is better than training during clerkship only or nontraining^[13] and they can attain a comparable level of competence as senior students. The present study supports what Jolly (1996) stated “seeing skills done in hospital does not contribute much to the acquiring skills, but doing the skills and practicing them at least once, increases skills competence by a measureable degree.” The assessment of the skills by an OSCE and its results, in the present study are in consistence with what Simon *et al.*^[14] found comparing OSCE results of 2nd-year medical students to those of [USMLE] step 1. The evaluation of the skills training was necessary because

Table 1: Statistical analysis of the OSCE results

Comparison between control and subjects (Senior students-Junior students) A AU 2010					
	Sig. (2-ailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
				Lower	Upper
S1	0.087	-0.1010	0.0587	-0.2169	0.0148
S2	0.032	0.1755*	0.0814	0.0149	0.3361
S3	0.000	0.3515*	0.0497	0.2533	0.4498
S4	0.000	-0.4082*	0.0694	-0.5451	-0.2712
S5	0.000	-0.3735*	0.0724	-0.5163	-0.2306
Total	0.026	-0.3556*	0.1581	-0.6686	-0.0426

OSCE: Objective Structured Clinical Examination, *Significant differences

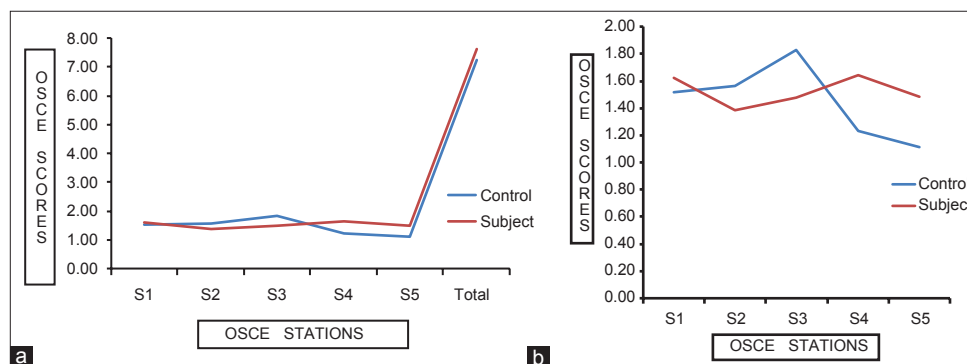


Figure 1: (a) The results of the performance of the junior students (subjects) and control in the Objective Structured Clinical Examination (OSCE), (b) comparison of the actual scores of the subjects and control in the OSCE stations Alzaeim Alazhari University 2010

assessment increases outcome compared with long time spend on practicing skill.^[15]

The skills acquired during CSL training remains to be evaluated as to whether they will be retained and transferred into real practice during the upcoming clerkship rotation and practice. One limitation of the study is that the students learned a limited number of basic skills only and the educational experience did not include skills of clinical reasoning. The study also did not investigate whether students prefer the CSL or hospital for training and what are their perceptions and attitude towards practicing on model and manikins instead of real patients. A study about the students' perception and preference of CSL or hospital for skill training, was conducted at the faculty of medicine of AAU and the results are in the processing.

CONCLUSION

Clinical skills laboratory training is effective and it can improve the skills competence of the junior medical students. Junior students trained in the CSL can attain a comparable level of skills competence as senior students when assessed after training. They can outperform senior students in procedural skills.

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