

## Perceptions of the Medical Students in King Abdul-Aziz University of Clinical Skills Module Preparing Them for the Clerkships

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**Abstract:** This study aimed to assess the effectiveness of clinical skills module in preparing fourth year medical students to their clerkships and to compare the students perceptions of their clinical skills before the start and after the completion of this module. The Medical College of King AbdulAziz University had introduced the “clinical skill module” to the fourth year students of the new curriculum for the first time in 2009/2010 in order to prepare the students for clerkships. A comparative cross sectional study was conducted on 4th year before the start and after finishing the module. A well constructed questionnaire, included clinical skills that are taught in the clinical module, was distributed to the all fourth year students. Data were analyzed using Statistical Package of Social Science (SPSS) software version 16 (2005). The results showed that the perceptions of the 4th year students about most of the studied clinical skills were significantly higher after the completion of the module when compared to those before the module had been started. Although the marked improvement in the students perception of most of the clinical skills, the scores of this perception were not optimum and there should be a continuous training of the students during their required clerkships in order to upgrade their clinical competence by the time of graduation. Conclusions, the introduction of clinical skill module enhanced the fourth year medical students' acquisition of the clinical competencies and prepared them to their clerkships. These results based on students perceptions before and after the module delivery.

**Key words:** Clinical skills mod, medical students, perceptions

### INTRODUCTION

The skills of patient interviewing and physical examination form the foundation for effective doctoring. Lack of clinical skills is often a source of insecurity for physician and represents potential danger for the patient (Board and Mercer, 1998). Clinical skills in “traditionally oriented” medical schools are usually learned by watching what clinicians do, by interviewing and examining patients, and by presenting findings to a supervisor (Sansou-Fisher *et al.*, 2002). Given such importance, it is not surprising that courses teaching these skills are pervasive throughout nearly all medical school curricula (Swanson and Anderson, 1993).

Training medical students to provide patient care requires that they gain competency in core clinical skills. These skills include proficiency in history taking and physical examination, oral and written communication, clinical procedures, basic radiology, evidenced-based medicine, and professionalism (Windish, 2000).

The transition students face moving from the preclinical to the clinical setting is extraordinarily

stressful; students feel anxious and unprepared for this transition (Alexander and Haldane, 1979; Prince *et al.*, 2005). The stress that students experience relates to the sharp differences in the learning environments, teaching styles, workload, and performance expectations between the preclinical and clinical arenas (Radcliffe and Lester, 2003). Preparing students to transition to the clinical training environment of clerkships continues to challenge educators. Even when students are provided early contact with patients and early clinical skills training, they still struggle with this transition (Prince *et al.*, 2005; Prince *et al.*, 2000; Van Gessel *et al.*, 2003).

In order to ease this transition, many medical schools teach data gathering (medical interview and physical examination) and communication/interpersonal skills during the preclinical years. Some schools have added Problem-Based Learning (PBL) courses to the preclinical curriculum to help students integrate their basic science knowledge with diagnostic and clinical reasoning skills early in their training (Newble and Clarke, 1986). Despite these efforts to prepare preclinical students for clerkships many students remain anxious.

The curriculum in medical college of King Abdul Aziz University (KAU) became integrated system-based since 2006/2007. The study in the medical college includes five years; three preclinical (second, third and fourth) years and two clinical (fifth and sixth) years apart from one pre-health foundation (first) year. KAU medical college was one of these medical schools that taught data gathering (medical interview and physical examination) and communication/interpersonal skills during the early clinical years through the “early clinical and communication skills module” that is delivered to the third year students. It also added the PBL as a teaching approach to most of the preclinical courses and modules.

Early exposure to clinical skills was one of the main themes discussed in General Medical Council (1993). There was evidence that the teaching of clinical procedures needed vast improvement (Nelson and Traub, 1993). Consequently, many medical schools in the UK and around the world have adopted the GMC’s recommendations and reported positive outcomes (Marcus *et al.*, 1994; Curry and Makoul, 1996). This is in line with the general concept of introducing curriculum reform to medical school training in different places around the world, and has been proven to provide a positive impact on students’ perception of their medical school experience (Lieberman *et al.*, 1997).

Some researchers in their studies had identified the skills that students at one school regard as most important to have mastered before beginning clerkship training (history taking/physical examination, proficiency in oral case presentations, and generation of differential diagnosis). They also identified the areas students find most anxiety provoking before and after they make the transition into clerkships that were oral case presentation skills and time management and self care respectively. These results could inform medical educators about needed curriculum to facilitate this transition and decrease the anxiety of students entering the clinical realm (Small *et al.*, 2008).

All these rationales had pushed the KAU medical college to introduce the “clinical skill module” to be delivered to the fourth year students of the new curriculum before they enter to the clerkships. So the research objective was to assess the effectiveness of this clinical skill module, in preparing the fourth year students to their clerkships.

## MATERIALS AND METHODS

A comparative cross sectional study was conducted on all the male and female medical students in the 4<sup>th</sup> year. It was conducted twice, the first one was at the beginning of the academic year (2009/2010) before the students had started the clinical skill module and the second was after they had finished it.

The course specification of clinical skill module applied for the 4<sup>th</sup> year was revised regards the psycho-motor skills that were assigned to be learned by the students. A well constructed questionnaire, which included all the clinical psycho-motor skills, was prepared to explore the clinical skills that the student masters.

A pilot study, using 30 questionnaires, was done before conducting the study. On the light of this pilot, the questionnaire was revised and slightly modified. The result of this pilot study was not included in the final study results. The questionnaire was included eight groups of skills: history taking and general examination skills, obstetrics, gynecological, chest, pediatric, Breast, abdominal and neurological examination skills as well as vital signs and instrumental skills. The reliability of questionnaires was tested and alpha Cronbach is 0.75.

The fourth year students were about 400. The researchers tried to recruit large number of students in the study. We distribute about 250 questionnaires for fourth year before and another 250 questionnaires after the clinical skills module.

**Ethical approval:** This research study has been approved by the biomedical research ethics committee of the medical college, King Abdul-Aziz University.

**Statistical analysis:** The data were collected and entered into computer. Statistical analysis was done by using Statistical Package of Social Science (SPSS) software version 16 (2005). The results were presented in the form of mean and standard deviation. Paired t test was used to compare the perception before and after clinical skills module. Significance was considered at p value less than 0.05.

## RESULTS

The response rates of the fourth before and after the clinical skills module were 74% (185) and 69% (172) respectively. Fourth year students’ perceptions regards their clinical skills were compared before and after the application of the clinical skills module. The results showed that there was a highly significant improvement of skills of; complete history taking, communicating efficiently with patient, performing general clinical examination using both models and simulated patients and formulating of a list of differential diagnosis after completion of the clinical skill module (Table 1).

There was a highly significant improvement of skills of measuring blood pressure, apical pulse, radial pulse and respiratory rate after completion of the clinical skill module. On the other hand, there was non-significant improvement of skills of measuring oral and axillary temperature after completion of the clinical skill module (Table 2).

Table 1: Perception of the 4th year medical students regards skills of history taking before and after clinical skill modules

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can take a complete history from the patient	1.8±1.1	3.20±0.75	t = 7.9***p<0.001
I can efficiently communicate with patients during history taking	2.07±1.01	3.29±0.82	t = 6.8***p<0.001
I can perform general clinical examination using models	1.56±1.32	3.1±0.91	t = 7.22***p<0.001
I can perform general clinical examination using simulated patients	1.74±1.27	3.09±0.93	t = 6.31***P < 0.001
I can formulate a list of differential diagnosis using data obtained from history & clinical examination	1.41±1.12	2.89±0.99	t = 7.21***p<0.001

Table 2: Perception of the 4th year medical students regards skills of measuring the vital signs before and after clinical skill modules

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can measure blood pressure	2.56±1.07	3.23±0.84	t = 3.64***p<0.001
I can measure oral temperature	2.71±1.01	2.89±1.22	t = 0.79 p = 0.43
I can measure axillary temperature	2.56±1.18	2.73±1.21	t = 0.78p = 0.70
I can measure apical pulse	2.07±1.37	2.88±1.04	t = 3.48**p = 0.002
I can measure radial pulse	2.85±0.98	3.6±0.57	t = 5.08***p<0.001
I can measure respiratory rate	1.83±1.2	3.65±0.51	t = 11.09***p<0.001

Table 3: Perception of the 4th year medical students regards skills of abdominal examination before and after clinical skill modules.

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can perform obstetric abdominal examination using models	1.17±1.18	2.67±1.19	t = 6.43***p<0.001
I can perform obstetric pelvic examination using models	1.02±1	2.06±1.26	t = 4.43***P < 0.001
I can perform speculum examination using models	1.1±0.97	1.9±1.24	t = 3.45***p<0.001
I can perform vaginal examination using models	1.07±1.01	1.6±1.36	t = 2.16*p = 0.033

Table 4: Perception of the 4th year medical students regards skills of chest examination before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can perform general respiratory examination	1.41±1.04	3.45±0.93	t = 10.36***p<0.001
I can elicit different signs of respiratory diseases	1.8±1.03	3.16±0.32	t = 7.58***p<0.001
I can perform general cardiac examination	1.71±1.31	3.32±0.80	t = 8.01***p<0.001
I can interpret heart sounds and murmurs	1.99±1.23	2.53±1.1	t = 4.56*p<0.001

Table 5: Perception of the 4th year medical students regards instrumental skills before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can perform intradermal injection	1.41±1.16	2.72±1.1	t = 5.88***p<0.001
I can perform subcutaneous injection	1.49±1.27	2.49±1.07	t = 5.74***p<0.001
I can insert an IV cannula	1.29±1.12	2.79±0.99	t = 7.3***p<0.001
I can collect venous blood samples	1.37±1.13	2.46±1.11	t = 4.9***p<0.001
I know how to get rid of sharp disposal instruments properly	1.68±1.06	2.65±1.17	t = 4.31***p<0.001
I can insert a gastric tube	0.83±0.89	1.18±1.3	t = 1.15***p = 0.13
I can insert Foley's catheter	0.8±0.84	2.16±1.46	t = 5.4***p<0.001

Table 6: Perception of the 4th year medical students regards instrumental skills before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can perform general pediatric examination	1.1±1	2.11±1.35	t = 4.13***p<0.001
I can provide routine care of the newborn	0.93±0.96	1.49±1.4	t = 2.25*p<0.026
I can measure infant head circumference	1.07±1.08	1.57±1.41	t = 1.95p = 0.053
I can measure pediatrics body temperature	1.17±0.95	1.64±1.38	t = 1.92p = 0.057
I can measure pediatrics BP	1.2±1.05	1.41±1.37	t = 0.85p = 0.29

Table 7: Perception of the 4th year medical students regards abdominal and breast examination skills before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can examine and compare both breasts on a model	1.02±1.15	2.94±1.14	t = 8.52***p<0.001
I can examine the axilla	1.15±1.12	3.09±1.05	t = 9.1***p<0.001
I can perform abdominal examination	1.35±1.14	3.45±0.76	t = 11.1***p<0.001
I can palpate the liver	1.71±1.15	3.3±0.91	t = 8.15***p<0.001
I can palpate the spleen	1.65±1.21	3.06±1.06	t = 6.35***p<0.001
I can palpate the kidneys	1.59±1.14	3.04±1.15	t = 11.24***p<0.001
I can percuss for ascites	1.23±1.07	3.35±0.87	t = 9.12***p<0.001
I can percuss abdominal organs	1.39±1.2	3.27±0.93	t = 9.1***p<0.001
I can percuss for shifting dullness	1.32±1.17	3.31±0.94	t = 8.59***p<0.001

Fourth year students perceptions regards performance of obstetric pelvic examination using models, after completion of the clinical skill module, was highly significant than those before the module had been started

(Table 3). There was a highly significant improvement of skills of performing general respiratory and cardiac examination and eliciting different signs of respiratory diseases and a significant improvement of the

Table 8: Perception of the 4th year medical students regards neurological examination skills before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I can perform neurological examination for the sensory functions	1.56±1.21	3.16±0.88	t = 8.03***p<0.001
I can perform neurological examination for the motor functions	1.59±1.14	3.14±0.94	t = 7.74***p<0.001
I can examine the ear using an autoscope	1.29±1.15	2.59±1.15	t = 5.73***p<0.001
I can perform ophthalmological examination	1.08±1.1	2.63±1.16	t = 6.9***p<0.001
I can examine the nose	1.1±1.04	2.74±1.07	t = 7.8***p<0.001
I can examine the throat	1.22±1.11	2.79±1.08	t = 7.32***p<0.001
I can use the ophthalmoscope	1.08±1.12	2.8±1.07	t = 7.9***p<0.001

Table 9: Perception of the 4th year medical students regards overall quality of their clinical skills before and after clinical skill module

Skills	Pre Mean±SD	Post Mean±SD	Test of significant
I just have an idea about the previous clinical skills	1.93±1.14	2.89±0.93	t = 4.76**p<0.001
I can do the previous clinical skills perfectly	1.12±1.03	2.97±0.92	t = 9.67***p<0.001
I now have experience doing the previous clinical skills	1.17±1.02	3.09±0.81	t = 10.71***p<0.001
I now have the experience to deal with real patients safely	1.32±1.01	2.96±0.91	t = 8.69***p<0.001
Overall, I am well prepared to the clinical years	1.29±1.29	3.06±0.96	t = 8.36***p<0.001

interpretation of heart sounds and murmurs after completion of the clinical skill module (Table 4).

Regards the instrumental skills, there was a highly significant improvement of skills of performing subcutaneous and intradermal injection, of inserting IV cannula, gastric tube, Foley's catheter, of collecting venous blood samples and of getting rid of sharp disposal instruments properly after completion of the clinical skill module (Table 5).

The fourth student perception, after completion of the clinical skill module, was significant regards performing general pediatric examination and providing routine care of the newborn. It was higher but non-significant regards the skills of measuring infant head circumference, pediatric body temperature and Blood Pressure when compared to those before the module had been started (Table 6).

There was a highly significant improvement of skills of examining and comparing both breasts and axilla on a model, of performing abdominal examination, of palpating the liver, spleen, kidneys, of percussing for ascites, abdominal organs and shifting dullness after completion of the clinical skill module (Table 7). Also, there was a highly significant improvement of skills of performing neurological examination of sensory, and motor functions, of ear, nose, throat and eyes (Table 8). The perception of the fourth year students regards their experience in doing the aforementioned clinical skills perfectly, of dealing with real patient safely and of being well prepared for the clinical years was highly significant after completion of the clinical skill module (Table 9).

## DISCUSSION

The clinical skill module was introduced in the fourth year of the new curriculum of KAU college of medicine, for the first time in 2009/2010 as a response to recommendations of many educationalist based on their experience in this area (Lam *et al.*, 2002; Teutsch, 2003; Windish *et al.*, 2004; Benbassat and Baumal, 2007). And this was in line with the general concept of introducing curriculum reform to medical school training in different

places around the world, and has been proven to provide a positive impact on students' perception of their medical school experience (Lieberman *et al.*, 1997).

The course specification of clinical skill module applied for the 4th year included the psycho-motor skills that were assigned to be learned by the students in order to prepare them for their clerkship. These skills were grouped into eight groups: history taking and general examination skills, obstetrics, gynecological, chest, pediatric, breast, abdominal and neurological examination skills as well as vital signs and instrumental skills. These skills were included into the six clinical competencies that were determined by clerkship directors (190) from 32 U.S. medical schools who were surveyed on the appropriate level of student preparation needed to begin the core clinical clerkships. The majority reported that students need at least intermediate ability in five of six competencies: communication, professionalism, interviewing/physical examination, life-cycle stages, epidemiology/probabilistic thinking, and systems of care. Thirty to fifty percent of clerkship directors felt students are less prepared than necessary in the six competencies. Views were similar across all specialties and generally did not differ by other clerkship director characteristics (Windish *et al.*, 2004).

The results of this study showed that the perceptions of the fourth year students about their acquired clinical skills during their study in their "clinical skill module" were significantly higher after they had completed the module when comparing with those before they had started it. These finding were in accordance with Lam *et al.* (2002) in his study on the medical school at the University of Hong Kong. A new medical curriculum based on an integrated, system-based approach with a small group problem-based learning component was introduced in this school, in September 1997. A Clinical Skills course was also included for junior medical students to allow them to acquire basic clinical skills. This was a significant difference to the earlier course in which medical students would have little or no clinical contact until Third Year (Lam *et al.*, 2002).

Lam *et al.* (2002) found also that students enjoyed the Clinical Skills sessions a great deal and they were very receptive to this medium of instruction that they felt was an interesting change from traditional classroom teaching. These sessions were therefore good at stimulating learning interest in the new curriculum. Students could get an impression of what it is like to be a doctor, and feel better prepared for their clinical studies in later years. Therefore, a large number of them thought it was useful to introduce clinical skills in the early years of their curriculum (Lam *et al.*, 2002). These findings are consistent with earlier reports (Marcus *et al.*, 1994; Curry and Makoul, 1996). This is why the KAU college of medicine, preferred to introduce the clinical skills module in the preclinical years.

The scores of students' perception of most of the tested clinical skills were not optimum (around 75%). This could be accepted from the 4th year students as they were exposed to these clinical skills during this "clinical skill module" for the first time in the new curriculum so it is expected that they will upgrade their level of clinical competencies during their study in the upcoming required clerkships.

There might be another explanation for this suboptimal score of the fourth year students' perception. Perhaps when students faced with a new component in a new curriculum, they had difficulty assimilating the skills into their overall learning. Despite the course organizers taking great care to provide clear learning objectives and supplementary reading material, some still felt confused about how much depth in which they were expected to learn the skills and this explanation was supported by Lam *et al.* (2002). He stated that even with the best efforts and preparation from teachers, students will naturally seek peer advice and reassurance concerning such issues and it is simply not possible to provide this at this stage of a new curriculum. It seems inevitable therefore those concerns will dissipate in subsequent years (Lam *et al.*, 2002).

Limitations of the study: The investigators were willing to have larger sample size of the fourth year students to ensure the validity and reliability of the study. Although we did directly assess students' perception of their clinical preparation for clerkships, we believe that clerkship directors are in the best position to assess student ability and preparation in these competencies. And this is what we will attend to do in the next study.

#### RECOMMENDATION

- Enhanced mastery of the key clinical competencies must be an essential educational priority deserving the attention of curriculum planners, because these areas are critical to competence as a physician.
- While greater time is being applied within the course to increase basic content mastery of the examination,

a parallel course one that teaches both advanced content mastery as well as reasoning and critical thinking skills could act synergistically in achieving the optimum desired results.

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