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Students' Perceptions about Their Preparedness to the Clinical Phase of a Medical Curriculum with Preclinical Clinical Skill Course: A Comparative Study

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Abstract: Although, early clinical skills training is emphasized in many medical schools, students still feel unprepared and anxious about starting their clerkships. KAU medical college introduced the clinical skill module to the 4th year students of the new curriculum before they enter to the clerkships. This study aimed to assess the effectiveness of this module in preparing students to clerkships and to compare their perceptions to those of the 5th year. A comparative cross sectional study was conducted on 4th year after finishing the module as well the fresh 5th year students. A well constructed questionnaire, included clinical skills taught was distributed to the students.

Key words: Anxious, suboptimum, module committee, significantly, questionnaire, Saudia Arabia

INTRODUCTION

The preclinical years of undergraduate medical education provide educational content in a structured learning environment whereas clerkships provide clinical training in a more experiential manner. Although, early clinical skills training is emphasized in many medical schools, students still feel unprepared and anxious about starting their clerkships (Small *et al*., 2008). 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; Chumley *et al*., 2005).

The transition students face moving from the preclinical to the clinical setting is extraordinarily stressful (Alexander and Haldane, 1979; Prince *et al*., 2005) students feel anxious and unprepared for this transition. 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 (Van Gessel *et al*., 2003; Prince *et al*., 2000). Studies have shown that medical students experience the transition between preclinical and clinical training as a stressful period. They are generally frustrated by their inability to apply their knowledge to solve clinical problems in practice. Students exposed to preclinical patient contacts did not experience a major gap between the preclinical and clinical phase and felt well prepared for the clerkships. So it is concluded that early patient contacts seem to ameliorate the shock of practice and prepare students for clinical work (Godefrooij *et al*., 2010).

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 5 years; three preclinical (second, third and fourth) years and two clinical (5th and 6th) years apart from one pre-health foundation (1st) 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.

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Over the last several decades, renewed and increasing emphasis has been placed on the courses provide medical students the skills necessary to effectively enter the clerkships in part because many 3 year clerkship faculty continue to express a desire for greater clinical aptitude from entering students (Teutsch, 2003).

Lam *et al*. (2002) found that it is useful to introduce clinical skills in the early years of a medical curriculum. A comprehensive course evaluation, using both quantitative and qualitative methods, helps to collect useful information on how the course can be improved. 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 4th year students to clerkships. The research questions were:

- To what extent did the 4th year students acquire the learning objectives set by the clinical skill module?
- To what extent did the 4th year students feel comfortable with their clinical preparedness before enter the clinical clerkships?
- Is there a significant difference in the 4th and 5th year student perception of the clinical skills that they learned?

MATERIALS AND METHODS

A comparative cross sectional study was conducted on all the male and female medical students in the 4th year after finishing their clinical skill module as well the 5th year students at the beginning of the academic year (2009/2010).

The course specification of clinical skill module applied for the 4th year and course specification of medicine and surgery applied for the 5th year were revised regards the psycho-motor skills that were assigned to be learned by the students. A well constructed questionnaire, that included all the clinical psycho-motor skills, was prepare 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 4th and 5th year students were 400 and 390, respectively. The researchers tried to recruit large number of students in the study. We distribute about 250 questionnaires for 4th year and 250 for 5th year. The results were analyzed for the significance by the SPSS (Statistical Package for Social Science).

RESULTS AND DISCUSSION

The response rates of the 4th and 5th year were 84% (210) and 76% (190), respectively with no significance difference was detected between the different years. The 4th and 5th year students' perceptions regards their clinical skills were compared and the results showed that there was a significant higher 4th year students' perception regards formulating a list of differential diagnosis than 5th year students. There was none significant difference between the two groups regards skills of communication with the patient, history taking and general examination of models and simulated patients as shown in Table 1.

Fourth year students' perceptions were better than those of the 5th year regards skills of measurement of apical, radial and respiratory rates although the difference was none significant. On the other hand, 5th year students perceptions regards measurement of blood pressure, oral and axillary temperature were significantly higher than those of the 4th year as shown in Table 2.

Fourth year students perceptions regards performance of obstetric pelvic examination using models was significantly higher than those of the 5th year and was higher but none significant, regards other skills of the obstetric and gynecological examination as shown in Table 3. There was none significant difference between 4th and 5th year students regards skills of respiratory and cardiac examination as shown in Table 4.

Table 1: Perception of 4th and 5th year medical student regards history taking, general examination skills and formulation of differential diagnosis

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can take a complete history from the patient	2.76±0.90	2.86±0.94	t = 0.68; p = 0.49
I can efficiently communicate with patients during history taking	3.12±0.97	2.99±0.75	t = 1.03; p = 0.302
I can perform general clinical examination using models	2.68±1.09	2.87±0.88	t = 1.22; p = 0.22
I can perform general clinical examination using simulated patients	2.96±0.92	2.67±0.98	t = 1.91; p = 0.057
I can formulate a list of differential diagnosis using data obtained from history and clinical examination	2.09±1.23	2.63±0.95	t = 3.22***; p = 0.002

Table 2: Perception of 4th and 5th year medical student regards vital sign skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can measure blood pressure	1.65±1.39	2.86±1.04	t = 6.41***; p>0.001
I can measure oral temperature	2.31±1.04	2.84±1.12	t = 2.27**; p = 0.007
I can measure axillary temperature	2.14±1.43	2.65±1.16	t = 2.55*; p = 0.012
I can measure apical pulse	2.42±1.15	2.06±1.09	t = 1.98; p = 0.051
I can measure radial pulse	3.29±0.86	3.28±0.80	t = 0.085; p = 0.93
I can measure respiratory rate	3.34±0.80	3.18±0.75	t = 0.32; p = 0.18

Table 3: Perception of 4th and 5th year medical student regards gynecological and obstetric examination skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can perform obstetric abdominal examination using models	2.35±1.25	2.14±1.33	t = 1.04; p = 0.29
I can perform obstetric pelvic examination using models	2.03±1.25	1.55±1.18	t = 2.48*; p = 0.014
I can perform speculum examination using models	1.73±1.27	1.46±1.11	t = 1.43; p = 0.153
I can perform vaginal examination using models	1.53±1.34	1.27±1.27	t = 1.33; p = 0.19

Table 4: Perception of 4th and 5th year medical student regards chest examination skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can perform general respiratory examination	3.25±0.90	3.15±0.76	t = 0.74; p = 0.45
I can elicit different signs of respiratory diseases	2.84±1.18	2.90±0.75	t = 0.40; p = 0.68
I can perform general cardiac examination	3.18±0.99	3.09±0.72	t = 0.96; p = 0.48
I can interpret heart sounds and murmurs	1.81±1.44	1.96±1.23	t = 0.71; p = 0.47

Table 5: Perception of 4th and 5th year medical student regards instrumental skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can perform intradermal injection	2.15±1.35	1.41±1.30	t = 3.5***; p>0.001
I can perform subcutaneous injection	2.23±1.43	1.67±1.35	t = 2.54*; p = 0.012
I can insert an IV cannula	2.35±1.36	1.69±1.28	t = 3.58***; p>0.001
I can collect venous blood samples	1.30±1.33	1.69±1.28	t = 1.77; p = 0.071
I know how to get rid of sharp disposal instruments properly	2.35±1.47	2.25±1.29	t = 0.47; p = 0.63
I can insert a gastric tube	0.82±1.17	1.12±1.21	t = 1.55; p = 0.122
I can insert Foley's catheter	1.95±1.47	1.05±1.09	t = 4.5***; p<0.001

There was significant higher perception of 4th year students than 5th year regards performance of intradermal and subcutaneous injection, insertion of an IV cannula and Foley's catheter. On the other hand, the 5th year perceptions were higher but none significant than 4th year regards collection of venous samples and insertion of gastric tube as shown in Table 5. There was significant higher perception of 5th year student than fourth year students regards most (three out of five skills) of pediatric examination skills as shown in Table 6.

Regards breast and abdominal examination skills, there was higher but insignificant perception of the 5th year students than in fouth year in almost all (six out of eight) of these skills as shown in Table 7. There were significant higher perception of the 5th year student than the 4th year regards throat and eye examination as well the use of autoscope and ophthalmoscopy and higher but none significant, perception of other neurological examination skills as shown in Table 8.

The 5th year students' perception regards performance of all the mentioned clinical skills perfectly was higher (but statistically insignificantly) than of the 4th year students. On the other hand, 4th year students felt that they had the experience to deal with real patients safely and they were well prepared to the clinical years more (but statistically insignificantly) than the 5th year students as shown in Table 9.

The clinical skill module was introduced in the 4th 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). 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).

There were some controversies about the proper time to introduce the clinical skill module into the new curriculum. Some feel that it was better to introduce it earlier. The rational was that although, such skills are necessarily taught before clinical decision making skills, medical students before the fourth year are also limited in their ability to think broadly about any medical problem simply because they have little contextual clinical experience. This view was supported by Alexander and Haldane (1979) who stated that In some ways, a paradox is created: the greater the clinical exposure, the better one's interviewing and examining skills become; however, one cannot interview and examine patients without first learning such basic skills. On greater reflection, however, this paradox leads to broader understanding of the core educational objectives embedded within such courses. It

Table 6: Perception of 4th and 5th year medical student regards Pediatric examination skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can perform general pediatric examination	1.29±1.17	1.80±1.30	t = 2.57*; p = 0.01
I can provide routine care of the newborn	1.09±1.20	1.48±1.09	t = 2.17*; p = 0.031
I can measure infant head circumference	1.75±1.38	2.48±1.30	t = 3.47**; p = 0.001
I can measure pediatric body temperature	1.59±1.36	1.92±1.26	t = 1.59; p = 0.113
I can measure pediatric BP	1.04±1.38	1.34±1.13	t = 1.51; p = 0.29

Table 7: Perception of 4th and 5th year medical student regards Breast and abdominal examination skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can examine and compare both breasts on a model	2.57±1.38	2.75±1.26	t = 0.83; p = 0.40
I can examine the axilla	3.21±0.96	3.15±0.74	t = 0.51; p = 0.61
I can perform abdominal examination	3.34±.092	3.47±0.50	t = 1.2; p = 0.23
I can palpate the liver	3.20±1.02	3.07±0.96	t = 0.17; p = 0.86
I can palpate the spleen	3.21±1.01	2.95±0.92	t = 0.80; p = 0.42
I can palpate the kidneys	3.32±0.99	3.45±0.60	t = 0.17; p = 0.86
I can percuss for ascites	3.31±0.96	3.40±0.60	t = 0.93; p = 0.53
I can percuss abdominal organs	3.30±1.01	3.32±0.67	t = 0.83; p = 0.47
I can percuss for shifting dullness	3.31±0.95	3.4±0.070	t = 0.68; p = 0.49

Table 8: Perception of 4th and 5th year medical student regards neurological examination skills

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I can perform neurological examination for the sensory functions	2.78±1.47	3.02±0.88	t = 1.57 p = 0.11
I can perform neurological examination for the motor functions	3.03±0.95	3.07±0.89	t = 0.30 p = 0.75
I can examine the ear using an autoscope	1.12±1.35	1.91±1.21	t = 3.8 *** p>0.001
I can perform ophthalmological examination	1.06±1.31	1.92±1.26	t = 4.23 *** p>0.001
I can examine the nose	1.45±1.33	1.82±1.13	t = 1.94 p = 0.053
I can examine the throat	1.54±1.35	1.97±1.22	t = 2.10 * p = 0.037
I can use the ophthalmoscope	1.01±1.17	1.83±1.29	t = 4.14 *** p<0.001

Table 9: Overall quality of skill learning among both 4th year medical and 5th year medical student

Skills	4th year Mean±SD	5th year Mean±SD	Test of significant
I just have an idea about the previous clinical skills	2.50±1.24	2.6±0.091	t = 0.65 p = 0.51
I can do the previous clinical skills perfectly	2.30±1.12	2.38±0.95	t = 0.42 p = 0.67
I now have experience doing the previous clinical skills	2.31±1.15	2.51±0.93	t = 1.18 p = 0.23
I now have the experience to deal with real patients safely	2.51±1.08	2.23±1.01	t = 1.68 p = 0.095
Overall, I am well prepared to the clinical years	2.25±1.23	2.17±1.13	t = 0.42 p = 0.67

is increasingly clear that the learner must master both the content skills necessary for an encounter (how to do it) as well as the reasoning process that seeks an effective and logical endpoint (why to do it). Arguably, neither is mutually exclusive, though mastery of both is essential.

The results of this study showed that the perceptions of the 4th year students about their acquired clinical skills during their study in their clinical skill module were varied according to the type of these clinical skills. When these perceptions were compared to those of the 5th year, the 4th year students were significantly better than the 5th years in so many clinical skills like; formulating a list of differential diagnosis, skills of measurement of apical, radial and respiratory rates, performance of obstetric pelvic examination using models, performance of intradermal and subcutaneous injection, insertion of an IV cannula and Foley's catheter. They felt that they had the experience to deal with real patients safely and they were well prepared to the clinical years more (but statistically insignificantly) than the 5th year students. These results were in favor of the clinical skill module.

On the other hand the 4th year students' perceptions about some other skills were not better, when compared to the 5th year, like; measurement of blood pressure, oral and axillary temperature, pediatric examination skills, throat and eye examination as well the use of autoscope and ophthalmoscopy. This could be attributed to many factors like the insufficiency of the allocated time to teach these skills, lack or inadequacy of models or manikins to learn these skills or may be the efficacy of the clinical instructor, whatever these causes, they should be investigated by the module directors and his assistants to be remedied.

Stillman and Sawyer (1992) stated that it is important to recognize that teachers' performance and attitudes also directly affect students' perception of the course. When the teachers appeared to lack understanding and enthusiasm themselves this created a bad impression. This form of teaching is very labor intensive and many teachers need to be recruited to assist in its execution. Staff as well as students are utilizing pedagogical techniques that are very different from the old curriculum. Inevitably there will be varying standards of skill and enthusiasm.

The scores of students' perception of most of the tested clinical skills were suboptimum for both 4th and 5th year, despite the presence of significant differences between the 2 years in some of these skills. 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 was not expected that they would optimally acquire these skills from the first time.

There might be another explanation for this low score of the 4th 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. This may be compounded by the feeling of being the experimental subjects in a new curriculum with no peer advice.

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 that such concerns will dissipate in subsequent years.

On the other hand, the 5th year students were exposed to most of these clinical skills during the preclerkships clinical rounds that they had received in their 4th year of the old curriculum, so their suboptimum scores of perceptions could not be acceptable. But this could be explained by the findings of Sicaja *et al.* (2006). They found that students' self-assessed level of clinical skills was lower than that expected by their teachers. Education during clinical rotations is not focused on acquiring clinical skills and additional clinical skills training has a positive influence on students' self-assessed level of clinical skills. There was no consensus among teachers on the required level of students' clinical skills.

Limitations of the study: The investigators were willing to have larger sample size of the 4th years 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.

CONCLUSION

The results showed that the perceptions of the 4th year students about their acquired clinical skills were varied according to the type of these skills. The 4th year students were significantly better in so many clinical skills while they were not better in some other skills when compared to the 5th year. The scores of students' perception of most of the clinical skills were suboptimum, for both 4th and 5th year. It is recommended that the module director and all the members of the module committee investigate the factors that contributed to this to be remedied.

RECOMMENDATIONS

- 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
- As the 4th year students' perceptions about some clinical skills were not better, when compared to the 5th year, it is recommended that the module director and all the members of the module committee investigate the factors that contributed to this to be remedied

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