

**Determinants of Effective Clinical Learning:  
Student and Teacher Perspectives  
in Saudi Arabia**

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**Determinants of Effective Clinical Learning:  
Student and Teacher Perspectives  
in Saudi Arabia**

Determinanten van Effectief Klinisch Onderwijs:  
Perspectieven van studenten en docenten in Saudi Arabië

**Thesis**

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Chapter

# 1

**Introduction**

# Introduction

Undergraduate medical education has witnessed a tremendous development in Saudi Arabia in the last 45 years. The first college of medicine has been established in the year of 1967 in King Saud University in Riyadh, the capital of Saudi Arabia. This was followed by another three colleges in King Abdul-Aziz University in Jeddah, at the west of the country, King Faisal University in Dammam, at the east of the country, and King Khalid University in Abha, at the south of the country. However, the number of physicians delivered by these medical colleges was under the national demand of physicians, as the percentage of Saudi doctors in the health services in Saudi Arabia was about only 20% of the total number of doctors in the practice in the year of 2008 <sup>(1)</sup>. So, about 80% of the doctors working in Saudi Arabia were expatriates. This fact could lead to instability of the provision of medical services, particularly in wars and crisis. Moreover, having a majority of doctors from different cultural backgrounds might have a negative effect on the patient-doctor communication and could minimize the quality of the healthcare services.

This severe shortage of Saudi doctors in Saudi Arabia has been met by the decision of the ministry of higher education to open new medical colleges. The number of medical colleges at the year of 2010 has been almost doubled compared to the number in the year 2005, from 13 to 21 <sup>(2, 3)</sup>.

In addition to the development of more medical colleges, there was an effort to introduce more innovative approaches and curricula in undergraduate medical education. This movement took place in response to the calls of many academic and professional leaders to rectify the observed deficiencies in undergraduate medical education. Those observations include the pure focus on teacher-centered approaches, the dichotomy between basic and clinical teaching, the teaching of huge and sometimes irrelevant topics, and the pure focus on hospital-based teaching <sup>(4, 5, 6)</sup>.

This analysis has resulted in the adoption of innovative approaches such as Problem Based Learning (PBL), community-based, and integrated approaches in the newly developed medical colleges. Medical colleges such as that of the King Saud Ben Abdul-Aziz University for health sciences (KSAU-HS) (established on 2004) and Al Qassim University (established on 2001) have started a PBL and community oriented curriculum from the outset. Other medical colleges at the old universities as King Saud University and King Abdul-Aziz University considered these developments in undergraduate medical education and reformed their curricula to be more integrated and PBL-based.

Another important development in the higher education, in general, in Saudi Arabia is the formation of the National Commission for Academic Assessment and Accreditation (NCAAA) in the year of 2005. The main aim of this national body

is to monitor and ensure the quality of the process of teaching and training of higher education including undergraduate medical education. NCAA is expected to periodically assess and accredit the medical colleges in Saudi Arabia.

Despite this development in the quantity and quality of the undergraduate medical education, serious concerns have been raised. Experts of medical education have raised some points which if not carefully attended, will negatively affect the quality of undergraduate medical education and the outcome of the medical colleges. Little availability of clinical training sites, clinical supervision, severe shortage of qualified medical faculty, and lack of appropriate strategic planning for establishing medical schools were of the main concerns <sup>(7, 8)</sup>.

As noted, the majority of the reported observations in undergraduate medical education were related to the quality of teaching and training of medical students. This dissertation was conducted to address some of the above mentioned concerns on the process of teaching and training undergraduate medical students in Saudi Arabia.

The main general concern is about the quality of the clinical learning environment. Some more specific concerns were about teaching and learning biomedical ethics, and exploration of factors that could influence the effectiveness of students' learning including use of alcohol, addictive substances, and tobacco smoking.

### *Objectives and outline of the dissertation*

This dissertation has six general objectives. The first objective is to present an overview of the literature concerning the factors that influence the effectiveness of the clerkships in undergraduate medical education and contribute to the development of clinical competence of medical students (Chapter 2). The second objective is to investigate the perception of medical students and teachers in Saudi Arabia concerning the determinants of the effectiveness of clinical learning (Chapter 3). Based on the outcome of that study, the third objective is to develop a new instrument to evaluate the quality of the clinical learning: The Clinical Learning Evaluation Questionnaire (CLEQ) (Chapter 4).

A rather new development in Medical Education in Saudi Arabia is the introduction of courses concerning teaching of biomedical ethics in the curriculum. Therefore the fourth objective of this dissertation is to study students' evaluation of their exposure to the teaching of ethics (Chapter 5). Medical education in Saudi Arabia takes place within a religious and political environment that sets several strong restrictions to the use of alcohol, drugs and smoking. However, students are also influenced and exposed to information from the western world through the influence of modern media and internet. Therefore the fifth objective of this dissertation is to study the perception of undergraduate medical students in Saudi Arabia regarding alcohol and substance use in the community (Chapter 6). The sixth

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objective, that is related to the fifth objective, is to study the knowledge, attitude and practice of tobacco smoking by medical students in Saudi Arabia (Chapter 7). In Chapter 8 the main results of the different studies will be summarized and discussed, and recommendations are made for further research.

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Chapter

# 2

## **Achieving Clinical Competence: Literature Review**

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The main aim of medical training is to acquaint students with the necessary competencies, both in 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 teaching takes place at a later stage. Clinical skills are usually taught by exposing students to patients through clinical clerkships. During these clerkships, students acquire diagnostic, treatment and patient-physician communication skills.

Clinical clerkships are usually organized through rotating students in different disciplines. The experiences of students in these rotations are variable, largely due to the unpredicted nature of clinical practice and difficulty in having previously well known contents of clinical activities. This makes teaching in clinical rotations much less structured compared to that of basic medical sciences.

Despite that, clinical rotations is believed to be of crucial importance to medical students as they provide means by which students can apply their knowledge and be introduced to their environment of future career.

### *Importance of Early Practical Experience*

Traditionally the curriculum of undergraduate medical schools is divided into two distinct phases, the preclinical and the clinical phase. Students' exposure to patients and clinical environment takes place in the clinical phase which is offered at a later stage of the curriculum. At present, more vertical integration of clinical experiences into the pre-clinical years is increasingly introduced in medical curricula.

Training of clinical skills early in the curriculum, with special emphasis on patient-centered experiences, has received recent support and encouragement <sup>(1)</sup>. Four major themes which demonstrated the benefits of early clinical experiences with patients for students have been identified. These themes were related to (1) the relationships and learning in early encounters with patients; (2) integration with learning to the entire curriculum; (3) aspects of doctoring learned; and (4) personal and professional growth. These aspects provide unique opportunities for students learning in an appropriate context <sup>(2)</sup>.

Early practical experiences help students to develop an appropriate attitude toward patients, promote their motivation and confidence. Students considered these experiences to be satisfying and they helped them to develop their professional identity. Early practical experiences gave students opportunities to apply and integrate their previous knowledge, develop interpersonal skills and appreciate the value of patient-centered care.

Another important role of early practical experiences is to familiarize students with clinical settings and make entering clerkship less stressful. It has been shown that early practical experiences took place mainly in community settings <sup>(3)</sup>.



Organizing integrated patient contacts was both feasible and well perceived by patients. It has been recognized to be educationally effective by all parties involved in this process <sup>(4)</sup>.

### *Settings of clinical learning and teaching*

Clinical skills' teaching has been done both in ambulatory care and inpatients settings. It usually takes place in three main different sites: teaching hospitals, general (community) hospitals and family and community centers. In recent years, a revolution has occurred in health care as a result of changes in practice of medicine and society. Greater use of technology leading to shorter average lengths in hospitals stay and a move toward management of chronic diseases in the community mean there are fewer hospital in-patients and secondary care is increasingly less able to provide medical students with sufficient experiences. Students' clinical experience in a traditional hospital setting has been shown to be very variable, with a significant number not encountering important clinical problems during their training.

Clinical skills teaching in general practice has been shown to be as effective as teaching in hospitals <sup>(5)</sup>. Perceived advantages of hospital-based learning include management of acute medical conditions and gaining experiences of procedures and investigations. Community based learning was perceived particularly appropriate for learning of a patient-centered approach care and for improving communication skills. Clinical skills acquisition was perceived to be equally learned in both settings <sup>(6)</sup>.

Although the experiences of students in an integrated primary care clerkship were variable, they were of good learning value as very little overlap was found in symptoms, conditions, procedures and other educational opportunities. These settings provide different and complementary learning opportunities <sup>(7)</sup>.

Students taught in family medicine clerkship had more confidence in acquiring a number of procedural and cognitive skills, including history taking and physical examination skills, while university hospitals clerkship had a positive impact on students' confidence in procedures largely performed in hospitals such as interpreting ECGs.8Students taught in general practice expressed a high degree of satisfaction with their learning of basic history taking and physical examination skills <sup>(8)</sup>.

The combination of teaching in general practice and hospitals is likely to provide the most effective technique to medical students. As students are exposed to diverse experiences with patients with common and chronic diseases in general practice, they should learn to experience the presentation of acute illnesses in hospital. Exposure of students to both settings will ensure that they encounter the common, acute and chronic conditions that affect patients in the 21st century <sup>(9,10)</sup>.

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Students can learn clinical skills as well in general practice as in hospitals. Efforts to redistribute resources from traditional locations for students learning to community should be supported. It is necessary to determine which specific knowledge, skills, and attitudes are best acquired in the community, which is best acquired in the hospital, and which can be equally well acquired in either environment given appropriate, well-structured, and adequately resourced teaching<sup>(5)</sup>.

Students highly valued learning in ambulatory care settings and found it more satisfying than their inpatient experiences. Students perceived that an ambulatory care setting provides excellent opportunities for involvement in direct patient care and they felt encouraged to take more responsibilities for patient care as well as their learning.

Students were able to develop more satisfying relationships with both their patients and their teachers during the ambulatory rotations than during their stay in the wards. Moreover, ambulatory students performed as well academically as their classmates<sup>(11)</sup>. In both settings, hospitals and general practice, students value greatly interaction with patients. They perceive these experiences as both educational and enjoyable. This demonstrates the importance of teaching a patient-centered approach to undergraduate students<sup>(12)</sup>.

Students' clinical performance did not differ overall by preceptors' teaching settings. OSCE scores for students in community-based and academic medical center affiliated clinics were similar. Since students' performances were similar across sites and disciplines, it has been recommended that focusing on improving clinical training across all sites<sup>(13)</sup>.

Ambulatory care education in the undergraduate years of medical training is of considerable importance. An important rationale for using ambulatory care is to give students exposure to problems seen by the physician in these settings, but rarely seen in inpatient settings. This experience is expected to augment students' skills and knowledge in pathology, natural history, and the progression of diseases that are not treated in hospitals. Ambulatory care education may also facilitate interpersonal skills, time management, information gathering and use, knowledge application, planning and coordination of care, and interest in primary care careers.

Despite the perceived educational value for experiences in ambulatory care settings, extensive reviews of these experiences have been shown to be characterized by variability, unpredictability, immediacy, and lack of continuity. Learners often are not exposed to varieties of patients' problems and opportunities to continuity of care were limited. Discussion with students and feedback from attending supervisors was limited as well.

In order to overcome these barriers it has been recommended to increase continuity-of-patients-care experiences and contact with faculty members,

encouraging collaborative and self-directed learning, providing faculty development, and strengthening assessment and feedback procedures <sup>(14)</sup>.

### *Documentation of students' clinical experience*

Students are exposed to extensive varieties of medical and non-medical experiences during clerkship training. Documenting and monitoring these experiences are of a great importance for students' learning and assessment. Available instruments to document the clinical experiences and activities include logbooks, handheld or laptop computers, and pocket-sized encounter cards. Availability of such instruments could facilitate students' documentation of clinical experiences and provide data on important differences among students' clerkship experiences and could be utilized in the process of assessment of the nature of students' clinical education <sup>(15)</sup>.

Moreover, utilization of logs provided the clerkship coordinators with a useful overview of the content and nature of students' learning experiences in the hospitals. Despite that, integrating logs into the supervisory activities was poor <sup>(16)</sup>.

Analysis of students' experiences showed significant heterogeneity with potentially worrisome gaps between them. These gaps are significant, as they are related to students' exposure to common medical problems <sup>(12,17)</sup>. In addition to the variability of students' experiences in clerkship, they tend to underreport them in their logbooks <sup>(18)</sup>.

Comprehensive documentation and feedback systems provide an essential infrastructure for the evaluation and enhancement of community-based teaching and learning in primary and ambulatory clerkships, whether separate or integrated <sup>(19)</sup>.

### *Influencing factors on the effectiveness of clinical teaching and learning*

The main aim of clerkship, whether in hospitals or in general practice, is to provide students with opportunities to be exposed to a diversity of authentic experiences by which they could apply and integrate their factual knowledge.

There are many factors that influence the quality of students' learning in these settings, like number of patients and varieties of pathologies (patient mix) seen by students, quality of feedback, students' relationship with faculty, and organization of teaching.

The effectiveness of clinical rotations depends on factors as supervision and patient mix. Issues like number of students participating in the clinical session at the same time didn't appear to affect student's clinical learning. Interestingly, the vital role of supervision was especially apparent when there was a limited patient

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mix. This emphasizes the fundamental role of supervision in compensating for of students' learning <sup>(20,21)</sup>.

Large variations of students' experiences were also reported <sup>(22)</sup>. It has been demonstrated that measuring effectiveness of clinical rotation by mainly relying on number of encounters with patients is not accurate. However, a main finding was that quality of supervision seems to be the most important determinant of students' learning.

Exposure to a large number of clinical problems is necessary for students to practice and strengthen their clinical skills. This is particularly important as the diagnostic process, to a great extent, depends on proper history and physical examination skills more than on results of laboratory investigations <sup>(23)</sup>.

Clinical experiences showed considerable variation between sites of student's learning, but post rotation scores were similar. Performance of students on OSCE was positively associated with high volume experience in emergency admissions and feedback, and negatively associated with high-volume outpatient clinical experience. These data highlight again the importance of both the volume of clinical experiences and quality of feedbacks <sup>(24)</sup>. Interestingly enough, another study showed that students' performance in a final examination was not related to students' clinical experiences, but to their strategic and deep learning styles. This suggests that acquisition of knowledge from clinical experience and the ability to continue to gain experience throughout a professional career could be predicted by knowing students' learning style <sup>(25)</sup>.

The amount of clinical training and time spent on a task are other identified factors that contribute to the development of diagnostic accuracy of medical students <sup>(26)</sup>.

Students' learning could be facilitated or obstructed by many factors. Facilitating factors include: allowing students to take more responsibilities on patients' care, independence, opportunities to practice different tasks, and receiving feedback. Other perceived promoting factors included perceptions of control of situation and understanding of the 'whole picture'. Students' learning could be obstructed by factors including less reliance on students, lack of continuity of supervision and lack of opportunity to practice <sup>(27)</sup>.

Clinical supervision has a vital role in undergraduate and postgraduate education. Supervision is defined as: "The provision of guidance and feedback on matters of personal, professional and educational development in the context of trainees' experience of providing safe and appropriate patient care" <sup>(28)</sup>.

Supervision should be offered in the context of learning to be effective. Other characteristics of effective supervision include offering constructive, structured

frequent and regular feedback sessions. In addition to clinical management, supervision should include teaching and research, personal and professional development and reflection. It also has been shown that direct observation of students and working together with supervisors positively affects patient outcome. <sup>28</sup>The quality of the supervisory relationship is probably the single most important factor for the effectiveness of supervision, more important than the method of supervision used <sup>(28,29)</sup>.

Teaching effectiveness is influenced by many behaviors of teachers as perceived by students. Those include demonstration of high quality clinical skills, practicing ethical medicine, keeping up-to-date in practice and showing a positive attitude and enthusiasm to teaching <sup>(30,31)</sup>. Learners indicated that respecting their autonomy and independence are other important characteristics of an effective clinical teacher <sup>(31)</sup>.

Feedback is an essential ingredient for effective learning. Students want feedback about their performance to gauge progress concerning knowledge, competence, and faculty expectations and rate giving feedback as an essential quality of an effective clinical teaching. Teachers also think feedback is important; particularly, it motivates students to improve <sup>(14,23,32)</sup>.

Despite the crucial role of feedback, the clinical education literature provides no consensual definition of it. The following definition of feedback has been recently proposed: "Specific information about the comparison between trainees' observed performance and a standard, given with the intent to improve the trainee's performance" <sup>(33)</sup>.

### *Clinical learning climate*

The clinical learning climate is believed to influence learners' behavior and predict students' satisfaction and success. The term "clinical learning climate" and "learning environment" are used interchangeably to describe the perceived "soul and spirit" of the medical curriculum <sup>(34)</sup>.

Early students' hospital experiences were perceived as "difficult" for many of them. This is due to the fact that they had insufficient guidance and support. Students felt also that teaching in this environment was opportunistic and less structured. Moreover, they reported that their contribution to patients' care was not encouraged. Students' relationships with other professionals, such as nurses, were found to be difficult, which may have had a negative impact on their motivation and learning. Students felt that doctors involved in their teaching differentiate between their gender and ethnic backgrounds. These issues compromised students' commitment and motivation.

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From early in the clinical course, students started to feel pressure to conform to medical norms of appearance and behavior. They were anxious to impress their teachers, and were very aware of the long-term influence that teachers might have on their careers in a system that is still, to large extent, based on patronage. Students perceived differences in doctors' attitudes towards them related to gender' ethnicity and personality factors, and both female and ethnic minority students perceived their career choices to be constrained from early in the course <sup>(35)</sup>.

### *Measurement of educational environments*

Tools which are available to measure the quality of the educational environment are:

#### **1- Dundee Ready Education Environment Measure (DREEM)**

This tool has been widely used as a tool to gather information about the educational environment. It was originally developed at Dundee and has been validated as a universal diagnostic inventory for assessing the quality of educational environment of different institutions. DREEM is a 50 item inventory consisting of five subclasses. It contains items about (1) student's perception of learning, (2) student's perception of teachers, (3) student's perception of academic atmosphere, (4) academic self-perception, and (5) social self-perception <sup>(36)</sup>.

#### **2- Postgraduate Hospital Educational Environment Measure (PHEEM):**

This is a validated 40-item questionnaire that measures perceptions of the clinical learning environment. It contains items (using 5-points scale) about feedback, facilities, and atmosphere <sup>(37)</sup>.

#### **3- The Clinical Learning Environment Inventory (CLEI):**

This is a 35-items containing instrument, assessing five different scales, namely, (1) Personalization, (2) Student involvement, (3) Task orientation, (4) Innovation, and (5) Individualization. This instrument is used to assess students' perceptions of the psychosocial characteristics of the clinical learning environment. In this environment students, clients, clinicians, clinical teachers, and other health care workers coexist, each with their own objectives <sup>(38)</sup>.

## Conclusion

Provision of a variety of adequate authentic clinical experiences is an essential requirement for clinical learning. These experiences should be patient-centered and introduced early in the curriculum.

Exposure to both clinical and non-clinical experiences should be appropriately documented and monitored to be incorporated in students' learning and assessment, and to ensure the effectiveness of the learning process.

Students' clinical learning and behaviors are influenced greatly by the learning environment. The combination of teaching in family medicine centers and hospitals is likely to provide the most effective approach for optimal clinical learning and teaching.

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Chapter

# 3

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

**Ali I. AlHaqwi  
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Mohi M. E. Magzoub  
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### Abstract

**Context:** Graduating clinically competent medical students is probably the principal objective of all medical curricula. Training for clinical competence is a rather complex process and to be effective requires involving all stakeholders, including students, in the processes of planning and implementing 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.

## 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 “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.

## Results

### *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).

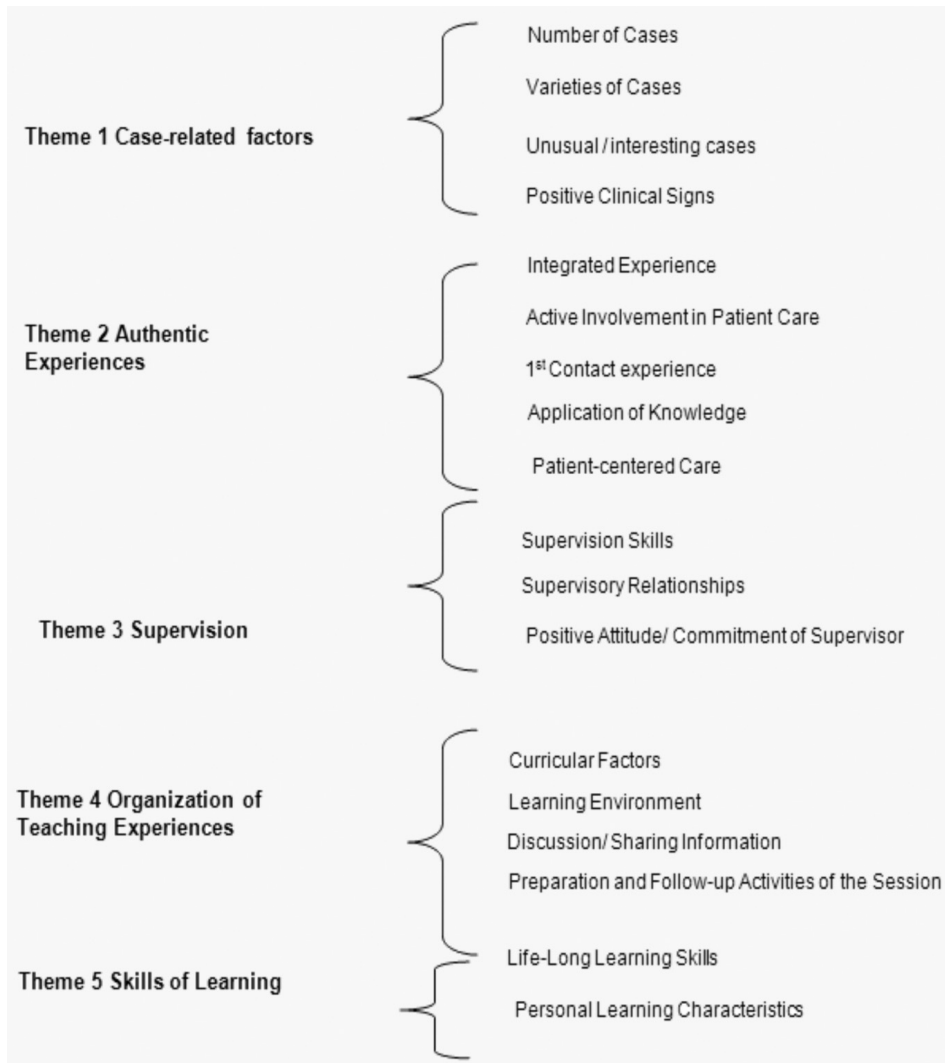
Five main themes were identified for the experiences and activities students felt to contribute to their clinical competence: (1) cases’ related issues, (2) authenticity of the clinical experiences, (3) organizational issues of clinical teaching sessions, (4) supervisor factors and (5) issues related to students’ learning skills. Table 1 shows examples of students’ responses in each of the five themes.

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**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

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



**Figure 1: Themes and sub-themes**

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

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### 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)*

#### *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*

#### *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, counselling 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*

3

### *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*

## Chapter 3

### ***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

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### 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) Supervisor factors (Table 2).

#### *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.



**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

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."*

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### ***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 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 to 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.

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Chapter

# 4

## **Development and factor structure, reliability and validity of the Clinical Learning Evaluation Questionnaire (CLEQ) for undergraduate clinical education**

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### Abstract

**Background:** Teaching and learning of clinical skills for undergraduate medical students usually takes place during the clinical clerkship. Therefore, it is of vital importance to ensure the effectiveness of the rotations within this clerkship. The aims of this study were to develop an instrument that measures the effectiveness of the clinical learning environment, to determine its factor structure, and to find first evidence for the reliability and validity of the total scale and the different factors.

**Method:** The Clinical Learning Evaluation Questionnaire (CLEQ) is an instrument, consisting of 40 items, that has been developed after consideration of the results of a qualitative study that investigated the important factors influencing clinical learning both from the perspective of students and teachers. Results of relevant literature that investigated this issue were also incorporated in the CLEQ. This instrument was administered to a sample of students ( $N = 182$ ) from three medical colleges in Riyadh city, the capital of Saudi Arabia. The factor structure of the CLEQ (Principal component analysis, Oblimin rotation) and reliability of the factor scales (Cronbach's  $\alpha$ ) were determined. Hypotheses concerning the correlations between the different factors were tested to investigate their convergent and divergent validity.

**Results:** One hundred and nine questionnaires were returned. The factor analysis yielded six factors: F1 Cases (8 items), F2 Authenticity of clinical experience (8 items), F3 Supervision (8 items), F4 Organization of the doctor-patient encounter (4 items), F5 Motivation to learn (5 items), and F6 Self awareness (4 items). The overall internal consistency ( $\alpha$ ) of the CLEQ was 0.88, and the reliabilities (Cronbach's  $\alpha$ ) of the six factors varied from .60 to .86. Hypotheses concerning the correlations between the different factors were partly confirmed, which supported the convergent validity of the factors but not their divergent validity. Significant differences were found between the scores of the students of the three different schools on the factors Supervision and Organization of patient-doctor encounter.

**Conclusion:** The results of this study demonstrated that the CLEQ is a multidimensional and reliable instrument. It can be utilized as an evaluation tool for clinical teaching activities, both by educators and students. More research is needed into the validity of the CLEQ.

The essence of medical education is to graduate competent medical professionals who have the essential clinical skills required for the management of common medical problems. As the process of clinical training takes place mainly during the clinical rotations, it is of vital importance to ensure that medical students are exposed adequately and early to clinical situations during their training.

Learning in the clinical setting is a complex process and could be influenced by many factors, such as the quality of the supervision, exposure to a variety of clinical experiences, quality of feedback and the length of time spent with patients <sup>(1-7)</sup>. The impact of these factors on the clinical learning of undergraduate medical students is variable <sup>(2)</sup>. However, students' performance on clinical examinations was found to be positively associated with exposure to a large variety of clinical cases and the provision of feedback from the supervisors <sup>(3)</sup>. Interestingly, the perception of medical students showed as well that these factors are important for the enhancement of their clinical learning <sup>(8)</sup>.

There are many tools to measure the educational environments in general, in different settings and different disciplines. Among them: the Dundee Ready Education Environment Measure (DREEM), the Postgraduate Hospital Educational Environment Measure (PHEEM) and The Clinical Learning Environment Inventory (CLEI) <sup>(9, 10, 11)</sup>. These instruments aim to explore the educational environment in general and its effect on the learning process. Factors as academic atmosphere, facilities, and psychosocial characteristics of the clinical learning environment were the main focus of these instruments.

Despite the increasing interest to measure the effectiveness of the clinical rotations for undergraduate medical students, only a few studies have addressed the quality of teaching in undergraduate clinical education <sup>(12, 13, 14, 15)</sup>. The study by Pololi and Price was one of the first to propose a measurement of the effectiveness of the clinical learning environment and the learning process of undergraduate medical students <sup>(12)</sup>. Another instrument is the Cleveland Clinical Teaching Effectiveness Inventory (CCTEI), which has been developed to evaluate the quality of the teaching process. This instrument has been tested and validated for the measurement of effectiveness of the teaching process for undergraduate and postgraduate medical students, both at an individual <sup>(13)</sup> and at a group level <sup>(14)</sup>. These two instruments focused on major issues that influence students' learning, such as teacher-learner relationship, self efficacy, and physician-patient relationship.

However, factors as the features of the clinical experiences and organizational issues were not explored.

The relationships between different variables involved in the clinical learning process of the undergraduate medical students have been studied and a model that explains how these variables work together for the effectiveness of the clinical rotation was proposed by Dolmans, et al. <sup>(16)</sup>. This model investigated

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the influence of factors as patient-mix, supervision and organizational issues in the effectiveness of clinical rotation. However, other important factors, such as motivation of students and features of the clinical experiences as authenticity that could influence this process as well were not investigated.

Based on the available data and considering possible factors that could influence the process of clinical learning, the present study was carried out to develop and test an instrument that could evaluate the quality of clinical education of undergraduate medical students better than the instruments mentioned above.

The first aim of this study was to investigate the reliability and factor structure of the instrument, that we have developed, and that we called the Clinical Learning Evaluation Questionnaire (CLEQ). It was intended to measure five factors that were found in our previous study<sup>(8)</sup> and that are often mentioned in the literature, namely: (1) Provision of clinical cases, (2) Authenticity of clinical experiences, (3) Quality of Supervision (further to be referred to as Supervision), (4) Organisation of the doctor-patient encounter, and (5) Motivation to learn.

The second aim of the study was to investigate the convergent and divergent validity of the factor scales by testing a number of hypotheses concerning the question how the factors that we have found are correlating. The third aim was to investigate whether there are differences between the three schools on the different factors, which would imply that the CLEQ is able to discriminate between the effectiveness of different clinical learning environments. The following hypotheses concerning the correlations between the five factors were formulated.

Hypothesis 1: Factor 1 Cases, which measures students' satisfaction with the number and variety of cases seen during clinical rotation, is expected to correlate positively with factor 2 Authenticity of the clinical learning experiences and factor 5 Motivation.

Hypothesis 2: Factor 2 Authenticity of the clinical experiences was also expected to correlate with factor 5 Motivation. We assumed that the more authentic the learning experiences are, the more motivation the students will develop.

Hypothesis 3: Factor 3 Supervision will be positively correlated with factor 4 Organization of the doctor-patient encounter and factor 5 Motivation. No or no significant correlations were expected between Factor 3 and Factor 1 Cases and Factor 2 Authenticity of the clinical learning experiences.

Hypothesis 4: Factor 4 Organization of the doctor-patient encounter will be related to factor 5 Motivation. The students' view to the organizational issues of the clinical rotations is not expected to correlate positively with their opinion regarding issues of the clinical cases (Factor 1), authenticity of the clinical experiences (Factor 2) and supervision (Factor 3).

## Method

### *Development of the Clinical Learning Evaluation Questionnaire (CLEQ)*

The first version of the CLEQ consisted of 40 items which aim to explore five main areas that may influence students' clinical learning. These areas are: provision of clinical cases (6 items), authenticity of clinical experiences (9 items), supervision (7 items), organization of the doctor-patient encounters (11 items), and motivation of students to learn (7 items).

The items of the CLEQ were phrased in a way that could reflect students' perception. For example: "*I have seen a sufficient number of cases.*" Students respond to each item by rating it on a five point Likert scale as (1) strongly disagree, (2) disagree, (3) undecided, (4) agree and (5) strongly agree. The details of the items of the first version are shown in the appendix.

### *Study Context*

The medical curriculum in Saudi Arabia is designed in a way that the first two to three years are devoted to the teaching of basic medical sciences. Clinical teaching usually takes place in the following three years. However, new trends in medical education encourage early exposure of medical students to clinical situations <sup>(17)</sup>. Thus variation of the timing of clinical training exists among different medical schools in Saudi Arabia.

The training of undergraduate medical students during clinical rotations is usually organized by rotating them through the main medical specialties: internal medicine, surgery, pediatrics, obstetrics and gynecology and family medicine. Students are also given the option to spend certain time in other disciplines as elective courses.

### *Participants*

Undergraduate medical students at the end of the clinical rotations were only included in this study because they were considered to be able to give their opinion about the different aspects of the clinical learning environment. All students in this phase of their study (N = 182) from three medical colleges in Riyadh City, the capital of Saudi Arabia, were invited to participate. They were instructed that their response, in filling out the questionnaire, should be based on their experience during the clinical rotations and not on their general impression. One hundred and nine questionnaires were returned (response rate = 60%). The mean age of the participants was 24 years ( $sd = 2.7$ ).

In the total sample of the three universities 41% of the participants were female. In the remainder of this article the three medical colleges will be referred to as

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School 1 (50% of the participants), School 2 (24%) and School 3 (26%). Students were either in their 3<sup>rd</sup> grade (14%), 4<sup>th</sup> grade (47%), 5<sup>th</sup> grade (25%) or 6<sup>th</sup> grade (12%); 2% did not answer the question which grade they were in.

With respect to rotation the majority of the participants (77%) could be divided over four medical specialties: Pediatrics (28%), Medicine (21%), Family Medicine (16%) and Surgery (12%). Of the remaining 23% of the participants, 17% were in another medical specialty, such as Obstetrics and gynecology, and elective courses as radiology and 6 % did not fill in their rotation.

### *Statistical Analysis*

To investigate the underlying dimensions of the CLEQ a principal component analysis was performed. Since we expected some factors to correlate, as mentioned above, we used Oblimin rotation. Next the reliability of the CLEQ and its dimensions were analyzed computing Cronbach's alpha. The convergent and divergent validity of the factors represented in the CLEQ was investigated by calculating Pearsons Product Moment correlations between them, therewith testing our hypotheses. Finally, ANOVA's were used to analyze the mean differences between the three universities on the dimensions of the CLEQ.

## Results

### *Factor analysis and reliabilities of the factors*

First, a factor analysis using principal component analysis with Oblimin rotation was performed, expecting a five-factor structure, because the CLEQ was developed according to the five domains that were expected to influence students' evaluation of the learning environment. The eigenvalues of the five components were as follows: component 1: 7.7; component 2: 3.0; component 3: 2.5; component 4: 2.2 and finally component 5: 2.0. These five components explained 43% of the total variance. However, a closer inspection of this five-factor structure revealed that a six-factor solution would better fit the data. Four items, now loading on different dimensions, could be better interpreted when allowing them to contribute to another, subsequent dimension. So, next a principal component analysis with Oblimin rotation was performed, expecting a six-factor structure. Of course, the eigenvalues of the first five components were the same as described above; the eigenvalue of the sixth component was 1.8. These six components explained 48% of the total variance. Table 1 shows the factor loadings of all 40 items on these six components together with Cronbach's alpha and the eigenvalues of these components.

**Table 1. Oblimin principal component loadings of the items on the six CLEQ-dimension (highest factor loadings in bold)**

	Cases	Authenticity	Supervision	Organization	Motivation	Self-Awareness
Item 1	<b>.49</b>	.23	-.04	-.31	.05	.10
Item 2	<b>.52</b>	.29	.09	-.29	.02	.10
Item 3	<b>.58</b>	.16	-.22	.15	.06	.16
Item 4	<b>.66</b>	-.14	.06	-.08	.16	-.26
Item 5	<b>.44</b>	-.32	-.27	-.09	.10	.23
Item 6	<b>.39</b>	-.07	.19	-.15	-.01	-.37
Item 7	<b>.54</b>	.12	-.12	.30	-.03	.09
Item 8	.21	<b>.59</b>	.07	-.19	.03	.19
Item 9	.11	<b>.54</b>	-.07	-.21	.03	.19
Item 10	-.01	<b>.49</b>	-.19	-.04	.04	-.07
Item 11	<b>.36</b>	.08	-.14	-.12	-.26	-.12
Item 12	.03	-.09	-.08	-.06	-.28	-.09
Item 13	.39	.09	.09	-.08	-.34	<b>-.41</b>
Item 14	.38	<b>.51</b>	.19	.11	-.31	-.16
Item 15	.16	.25	-.14	-.09	<b>-.36</b>	-.30
Item 16	-.02	-.02	<b>-.71</b>	-.04	.04	-.06
Item 17	.05	-.23	<b>-.75</b>	-.03	.08	-.02
Item 18	-.07	.24	<b>-.81</b>	.09	-.01	.13
Item 19	-.01	.02	<b>-.86</b>	.04	-.01	.02
Item 20	.10	.10	<b>-.75</b>	.06	-.13	.01
Item 21	.13	-.07	.04	-.26	.21	.19
Item 22	-.07	.03	-.38	.14	.09	<b>-.51</b>
Item 23	.03	<b>.46</b>	-.09	.19	.01	-.33
Item 24	.03	<b>.65</b>	-.02	.13	.11	-.02
Item 25	-.12	<b>.44</b>	-.07	-.12	.03	-.31
Item 26	.02	<b>.39</b>	-.26	-.03	.25	-.27
Item 27	.36	-.07	<b>-.49</b>	-.03	.04	-.01
Item 28	.23	-.33	-.29	<b>-.49</b>	-.04	-.19
Item 29	-.11	-.11	.09	<b>-.79</b>	-.02	-.09
Item 30	.02	.20	.02	<b>-.68</b>	-.08	.02
Item 31	-.19	.29	-.29	<b>-.45</b>	-.25	-.04
Item 32	-.03	.32	<b>-.47</b>	-.32	-.16	.01
Item 33	.07	.26	<b>-.38</b>	-.37	-.08	-.18
Item 34	.02	.07	.07	-.08	.12	<b>-.74</b>
Item 35	-.07	-.07	-.02	-.04	.09	<b>-.72</b>
Item 36	.02	.01	.05	.15	<b>.78</b>	-.25
Item 37	.07	.01	-.19	-.02	<b>.76</b>	-.22
Item 38	.14	.21	-.07	-.33	<b>.39</b>	-.07
Item 39	.11	-.04	-.27	-.16	<b>.37</b>	-.19
Item 40	-.03	.26	-.02	-.29	<b>.36</b>	-.06
Alpha	.69	.75	.86	.62	<b>.70</b>	.60
Eigenvalue	1.8	7.7	3.0	2.5	<b>2.2</b>	2.0

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It was decided only to interpret items with loadings of .30 or higher because these are probably important and reliable <sup>(18)</sup>. When an item had two or more factor loadings higher than .30 it was assigned to the factor on which it had the highest loading. Next, we will describe the factors keeping the order of factors as we described them in the introduction, with the added factor Self awareness as Factor 6.

### ***Description of the six factors***

#### ***Factor 1: Cases (8 items)***

Two items that were intended for the factor of Authenticity of clinical experience in the first version of the questionnaire appeared to load higher on the factor of “Cases” than on “Authenticity of clinical experience” and have therefore been added to this factor. These items are item 7: *“I have the opportunity to have the first contact experiences with patients”*, and item 11: *“I have the opportunity to apply my previous knowledge in patient care”*. These items were closely linked to cases and were considered as features of cases rather than the experience as a whole. Out of the eight items of this factor the statement with the highest loading was: *“I have seen many interesting clinical cases”*. This item was followed by statements with loadings ranging from 0.58 to 0.34, which include statements about the variety and the number of clinical cases. Other items and their loadings are shown in Table 3. The reliability (Cronbach’s  $\alpha$ ) of this factor was 0.69.

#### ***Factor 2: Authenticity of clinical experiences (8 items)***

The initial version of this factor had nine items (7-15). Five of these items did not emerge in this factor. Two items (7 and 11) had a higher loading on the factor Cases, one item (12) has been deleted because of a non-significant loading, one item (13) had a higher loading on the factor Self awareness and one item (15) had a higher loading on Motivation. However, four items, expected to belong to the factor of Organization of the patient-doctor encounters, appeared to have the highest loading on this factor. So, finally a total of 8 items loaded high on this factor. and The loadings of the items range from 0.65 to 0.40 and Cronbach’s  $\alpha$  of this factor was 0.75.

#### ***Factor 3: Supervision (8 items)***

This factor contains eight items and has the highest internal consistency among the other factors ( $\alpha = 0.86$ ). The 8 items all loaded negatively on this factor. To ease interpretation we multiplied all 8 loadings with -1 (19). The result of this multiplication is that scoring high on these 8 items means that the participants are satisfied with the received supervision. One statement (item 21) from this factor in the first version of the questionnaire was deleted as it had no significant



loading on it. Another item (22) loaded higher on the factor Self awareness. In addition three items (27, 32 and 33) that were intended for the factor Organization of the doctor-patient encounters in the first version of the questionnaire had a higher loading on the factor Supervision and were therefore added to that factor. The highest loading item (0.84) on this factor was: *"The way my supervisors deal with medical students was satisfactory"*. This was followed by items related to the commitment of supervisors, their teaching skills, respect of students and their communication skills (0.81, 0.75, 0.74, and 0.71 respectively).

#### *Factor 4: Organization of the doctor-patient encounters (4 items)*

This factor contained 11 items in the initial version of the questionnaire (items from 23 to 33). However, four items (23, 24, 25 and 26) had higher loadings on the factor Authenticity of clinical experiences, three items (27, 32 and 33) had a higher loading on the factor Supervision. The four remaining items under this factor had loadings ranging from 0.45 to 0.80. The item with the highest loading (.80) was related to the number of students who attend the clinical session followed by the item about adequacy of time spent with patients (.68). Cronbach's  $\alpha$  for this factor was .62.

#### *Factor 5: Motivation to learn (5 items)*

This factor contains the expected five items (36-40), however, unexpectedly item 15 also had a high negative loading on this factor. We believe that this item is not well-constructed and leads to confusion by the participants. Therefore, we deleted this item. The highest loading was for the items of: *"I am eager to learn"* (0.78) and *"I am able to look for new information"* (0.76). The reliability was satisfactory:  $\alpha = .70$ .

#### *Factor 6: Self awareness (4 items)*

Four statements had a significant loading on this factor (13, 22, 34 and 35). Cronbach's  $\alpha$  for this factor was .60.

A total of 3 items were removed from the final questionnaire; items 12 and 21 had no loadings higher than .30 on any of the six factors; item 15 had a high loading on the factor Motivation, but was difficult to interpret, that is it could not logically be assigned to this factor, probably due to ill-construction of the item. The next analyses were performed using the mean scores of all participants on the six factors based on the 37 remaining items.

To test the hypotheses that were formulated in the introduction, correlations were computed between the six factors. Table 2 shows these correlations.

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**Table 2. Correlations between the six factors (Total N = 109)**

	1. Cases	2. Authenticity	3. Supervision	4. Organization	5. Motivation	6. Self- Awareness
2	.37**					
3	.39**	.41**				
4	.31**	.33**	.40**			
5	.29**	.26**	.32**	.25*		
6	.24*	.36**	.30**	.27**	.30**	

\* significant at 0.05 level

\*\* significant at 0.01 level

Table 2 shows that all correlations between the six factors are significant at the .01 level with the exception of the correlations between Motivation and Self-awareness and between Self-awareness and Cases, which are significant at the .05 level. These results confirm our expectations mentioned in hypotheses 1 to 5 as far as positive correlations were expected. However, our expectations about the absence of correlations between for example factor 1 Cases and factor 3 Supervision were not supported. Apparently, all factors relate to each other. This might raise the question whether it is meaningful to differentiate between these six areas of student's learning evaluation. However, the magnitude of the correlations (all between .24 and .41) indicates that each factor may contribute differently to the quality of the clinical learning environment.

Finally, the mean differences between the three medical schools on the six factors were investigated. Table 3 shows the results. Table 3 reveals that the three medical schools had significant mean differences on two of the six factors, namely Supervision ( $F = 9.7$ ;  $p < .01$ ), and Organization of the doctor patient encounter ( $F = 4.16$ ;  $p < .02$ ). On the factor Supervision School 2 and 3 had approximately the same average score ( $M = 3.5$ ) and School 1 had a significantly lower average score ( $M = 2.8$ ). On the factor Organization School 2 showed the highest mean score ( $M = 3.54$ ); this was significantly different from the mean scores of School 1 ( $M = 3.11$ ) and School 3 ( $M = 2.99$ ). On the other four factors no significant differences between the three schools were found.

**Table 3. Means, standard deviations, *F*- and *p*-values on the CLEQ-dimensions per medical school (Total N = 109)**

Factor	Name of University	N	M	Sd	<i>F</i>	<i>p</i>
Authenticity	School 1	55	2.67	.75	1.27	.28
	School 2	26	2.92	.65		
	School 3	28	2.79	.53		
Supervision	School 1	55	2.88	.83	9.71	.00
	School 2	26	3.51	.71		
	School 3	28	3.54	.63		
Motivation	School 1	55	3.75	.78	.00	.99
	School 2	26	3.75	.68		
	School 3	28	3.76	.53		
Self awareness	School 1	55	3.11	.81	1.09	.34
	School 2	26	3.31	.65		
	School 3	28	3.35	.78		
Organization	School 1	55	3.11	.64	4.16	.02
	School 2	26	3.54	.67		
	School 3	28	2.99	.96		
Cases	School 1	55	3.13	.63	.04	.96
	School 2	26	3.16	.71		
	School 3	28	3.17	.63		

## Discussion

In this study we described the development of a new instrument (CLEQ) for the evaluation of the clinical learning environment from the perspective of undergraduate medical students. This instrument was needed because of shortcomings in already existing instruments that were developed in the past. The 40 items of the CLEQ were based on our previous study of the perceptions of students and teachers concerning an effective clinical learning environment<sup>(8)</sup>, and on a survey of the literature. These items were placed under five factors, namely Cases, Authenticity of the clinical learning experience, Supervision, Organization of the doctor patient encounter and Motivation to learn. The main aims of the study were to investigate whether these factors were confirmed by means of factor analysis, and to determine the reliability and validity of the different factors. The study was executed under 109 students coming from three medical schools in Riyadh, Saudi Arabia.

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Summarizing, the results have shown that the CLEQ is a multidimensional instrument which consisted of six factors. In the factor analysis we found support for the existence of the first five factors mentioned

above. However, the data could be better explained adding a sixth factor, Self-awareness. This last factor has to do with knowing your strengths and limitations as a doctor. The overall internal consistency of the CLEQ is high (Cronbach's  $\alpha = 0.88$ ). The reliabilities of the six different factors range from reasonable (Cronbach's  $\alpha = 0.60$  for the factor Self-awareness, to 0.86 for the factor Supervision).

After establishing the final factor structure of the CLEQ the items of this instrument were attributed to the factors on which they had the highest loading. Then, to investigate the validity of the different factors, we tested a series of hypotheses concerning the correlations between the factors. Surprisingly, all factors were positively related to each other, therewith giving support to their convergent validity. However, no support was found for their divergent validity. Although the highly significant correlations between all six factors might indicate that there is no need to differentiate between them, the fact that the correlations are all around .25 -.40 leave room for separate contributions of each single factor to the quality of the learning environment. Moreover, the results have shown that the new instrument is to some extent able to discriminate between the quality of the clinical learning environment of the three different schools that were involved in this study. The scores of the schools differed on the factors Supervision and Organization of the doctor patient encounter.

### *Limitations of the study and recommendations*

The first limitation of this study is that the CLEQ has been developed and tested in only one country, Saudi Arabia. However, the way in which clinical education is structured has much in common with the way it is structured in other parts of the world. The medical program in one of the schools that was involved in the study is actually based on an Australian medical program. Nevertheless, application of the CLEQ in undergraduate students from medical schools in other countries is needed to investigate whether we could find comparable psychometric properties of this instrument.

A second limitation is that for the investigation of the construct validity of the six factors we have not been able to do research into correlations between these factors, that are based upon subjective self-reports of the students, and criteria that have been more objectively determined. So, for example for the factor Cases, to have more support for its construct validity, we recommend an investigation in which the scores on this factor in different medical schools with different educational approaches, is correlated with objective data on how many cases the undergraduate students actually have to deal with. For the factor Supervision the

relationship between the subjective scores of the students might be correlated with an objective measure; if, for example, the supervisors are willing to have their supervision sessions video recorded and objectively evaluated by a panel of experts, this might lend more support to the construct validity of the factor Supervision. The construct validities of the more personal factors Motivation and Self awareness need to be further supported by examining the relationship between the scores of the students on these factors and objectively identified achievements, for example on examinations and assessments of experts on their practical functioning with patients.

### *Practical use of the CLEQ*

The CLEQ is meant to be used in medical undergraduate programs, and results from it can be informative both for the staff that is responsible for the quality of the clinical rotations and for the students themselves. It offers the opportunity to the staff of these programs to evaluate the quality of their own clinical learning environment. If the scores show that students' perceptions are that they see not enough cases, or not enough difficult cases, or that the authenticity of the clinical learning experiences is questionable, measures have to be taken to improve the system of clinical rotations. If the scores show that students perceive the quality of supervision as too low, supervisors should receive this feedback and try to improve their supervising skills. If the organization of the doctor patient encounter is considered by students as inappropriate, this organization has to be improved.

On the other hand, if scores on motivation and self awareness are low, that might be given as feedback to the students, either on the group level or on the individual level. Of course, in case of high scores on the different clinical environment factors, this might serve as positive feedback to the people who are responsible for the quality of the program, and high scores on the personal factors motivation and self awareness can serve as feedback to the students that they are on the right track to become a good doctor.

### Appendix 1

#### Clinical learning evaluation questionnaire (CLEQ) for undergraduate medical education

##### **Cases:**

1. I have seen a sufficient number of clinical cases.
2. I have seen a sufficient number of new clinical cases.
3. I have seen a good variety of clinical cases.
4. I have seen many interesting clinical cases.
5. I have seen some cases with positive clinical findings.
6. I have seen some unusual/rare clinical cases.

##### **Authenticity of clinical experiences:**

7. I have the opportunity to have the first contact experiences with patients.
8. I am actively involved in the patient care.
9. I have the opportunity to deal with patient as a real doctor.
10. I have the opportunity to deal with the patient as a whole and not limited to a certain system or organ.
11. I have the opportunity to apply my previous knowledge in patient care.
12. I have never been able to write in the patient's medical chart.
13. I have the opportunity to apply a patient-centered approach.
14. I have the opportunity to take responsibility for patient care.
15. I have the opportunity to communicate with patients and their families.

##### **Supervision:**

16. My supervisors have good communication skills.
17. I have been respected by my supervisors.
18. The supervisors are committed for teaching.
19. The way my supervisors deal with medical students
20. is satisfactory.

21. I think supervisors have good teaching skills.
22. I have rarely received a good feedback on my clinical performance from my supervisor.
23. I think that some supervisors could be considered as role models.

##### **Organization of the doctor-patient encounter:**

24. The objectives of the clinical rotations are clear.
25. Students have some input for the organization and development of the clinical rotations.
26. I have the opportunity to prepare before the clinical encounter.
27. I have the opportunity to reflect and read after the clinical encounter.
28. I have the opportunity to discuss clinical cases with my supervisors.
29. I have the opportunity to share the clinical cases with other students.
30. The number of students in the clinical sessions is appropriate.
31. The time spent with my patients is adequate for my clinical learning.
32. I have the opportunity to utilize skills lab and simulation for clinical cases.
33. I think the assessment of the clinical learning is aligned with objectives.
34. I was given enough assignments during my clinical rotation.

##### **Motivation\ learning skills:**

35. I adequately know my learning needs
36. I know my limitations.
37. I am eager to learn.
38. I am able to look for new information
39. I come to the clinical sessions prepared and ready.
40. I enjoy learning in clinical sessions.
41. I am able to express myself and show confidence.

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Chapter

# 5

## **Medical Student's Evaluation of their First Ethics Teaching Exposure**

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A slightly different version of this chapter was published as:  
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teaching of ethics. J Family Community Med 2010; 17(1): 41–45.

### Abstract

**Background:** The subject of Biomedical Ethics has become recognized as an essential component in the education of medical students. It should be integrated into the undergraduate medical curriculum.

**Objectives:**

1. To review the current Biomedical Ethics Course offered at the College of Medicine-King Saud bin Abdul-Aziz University for Health Sciences (KSAU-HS).
2. To explore the medical students perceptions about the different components of the course.

**Methods:** The medical students were requested to participate in the study at the end of the course by filling in a pre-designed questionnaire. A qualitative approach was used also to examine their perceptions about certain components of the course.

**Results:** Forty one medical students participated in this study. All students expressed their strong agreement on the importance of their need to learn biomedical ethics. Their views about the role of Biomedical Ethics were also considered. These include professional development, assessment of ethical competencies, and the timing of ethics teaching.

**Conclusion:** The students provided valuable comments that were supported by the literature reviews. Medical students' views of the various components of biomedical ethics teaching is of high value and should be sought in the planning of such a curriculum.

**Keywords:** Bioethics, Bioethics curriculum, Bioethics teaching, Bioethics learning and Professional Development.

Although the importance of medical ethics was recognized a long time ago, it has been emerged as a priority in formal medical education only in the past three decades <sup>(1)</sup>. This is probably due to increased public pressures, advances in diagnostic and therapeutic interventions, and publicity of medical errors. Since 1990 medical ethics courses have become an integral part of the core curriculum in most medical schools in western countries <sup>(2)</sup> as a response to the recommendations of general medical council (GMC) in tomorrow's doctors' document <sup>(3)</sup>

However, formal inclusion of medical ethics in medical curriculum has resulted in a variety of ethics curricula with diversity of goals and methods used <sup>(2, 4, 5)</sup>. Thus, provision and assessment of ethics varies greatly among undergraduate medical programs even within the same country <sup>(2)</sup>. In these settings undergraduate medical students continue to report low levels of confidence in their ability to address ethical challenges and have a perceived need for additional support from their clinical teachers <sup>(6)</sup>. In the west deep shortcomings in the literature in medical ethics education were reported in many areas including those addressing teaching methods and outcomes for students <sup>(6)</sup>.

In Saudi Arabia, many medical schools have been established recently and through personal communications we learn that medical ethics teaching exists in most if not all our medical schools. However, authors failed to find published literature locally on this important subject.

Thus, this paper reports our experience in running and evaluating an undergraduate medical ethics course particularly in relation to students' experience of their first exposure to medical ethics teaching. The aim is to stimulate discussion on how to improve our teaching of medical ethics.

### ***Methods, Setting and Subjects***

**Setting:** Medical school at Kind Saud bin Abdul-Aziz University for Health Sciences (KSAU-HS) offers a problem based, community oriented and integrated undergraduate curriculum. Medical ethics teaching is given in 4 weeks course in the 1st year and multiple sessions integrated longitudinally within different blocks in the curriculum.

By the end of this course, the following objectives are expected to be achieved by students:

1. Description of the major principles of medical ethics.
2. Provide definitions and give supporting evidence to the importance of autonomy, confidentiality, adequate information and building trust.
3. Description of ethical and legal issues related to medical research on patients.
4. Description of the ethical boundaries of genetic therapy.
5. Description of the ethical issues related to the right of individuals including human rights, to quality healthcare and equitable distribution of resources
- 6.

The contents of the course are shown in Table 1.

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**Table 1. The contents of the course.**

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<ul style="list-style-type: none"><li>● Ethical theories and principles</li><li>● Informed consent</li><li>● Confidentiality</li><li>● Truth telling and withholding information</li><li>● Research ethics</li><li>● Islamic values</li><li>● Ethical problems</li><li>● Reproduction control and abortion</li><li>● Medical errors</li><li>● Islamic medical ethics</li><li>● Patient-doctor relationship</li><li>● History of medical</li><li>● Genetic control</li></ul>
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The content has been supplied by three problems. These problems have the following objectives to cover: definitions of ethics, identifications of ethics principles, and patients' right, ethical principles of blood transfusion, limitations of consent taking, breaking bad news, terminal illness and care of dying persons.

Each PBL session was conducted over two sessions using the "seven" jumps of BPL session.

### ***Assessment***

Students were assessed on their participation in PBL tutorials, attendance, individual assignments, midterm examinations and final examination. The examinations were of short answer questions (SAQ) and extend matching questions. In SAQs students were given principle or ethical problems and were asked to identify the problems, and outline how they would approach ethical dilemmas.

Students were requested to write an individual report on a real encountered ethical problem that has occurred to them or to their relatives or have gained attention on the media. This report had to include a description of the problem and explanation of the ethical dilemma and how it could be solved. This assignment was intended to encourage students to reflect on what they had learned and its application in the real medical world.

## Methods

Undergraduate medical students were requested to participate in this study by filling a self administered questionnaire. The questionnaire consists of three main sections. The first includes rating of students' perception on the importance and their need of ethics teaching, relevance of contents, whether ethics teaching is a common sense or require formal teaching, timing of ethics teaching in the curriculum and their opinion on assessment used. Some of these questions were used in a previous study <sup>(8)</sup>.

The second section includes rating of the 3 problems used for the PBL sessions in term of their amount learned from the problem, relevancy and whether they are stimulating.

Students were asked to answer the questions of these two sections by rating their opinion on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The third section consists of open-ended questions to reflect students' opinions on what they have benefited from the course, recommendation for future ethics teaching opportunities, what are most needed areas in ethics teachings and how could this ethics teaching contribute to their professional development.

A qualitative approach was used to examine students perception of the ethics course. We investigated their opinions in relation to the importance of the topic, contents of the course, timing, teaching methods and assessment.

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## Results

A total number of forty-one medical students participated in the study. Students expressed strong agreement on the importance and their need for learning principles of medical ethics for their future professional practice. To a lesser extent, they thought that the contents of the course were relevant to their culture and to themselves. They disagreed that medical ethics is just common sense. They couldn't decide whether the assessment methods used in the course were appropriate or not. Details of their responses are illustrated in Table 2.

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**Table-2: Students' evaluation of different components of the course.**

Frequency distribution on the basis of students' response against each variable	Strongly disagree	Disagree	I don't know	Agree	Strongly Agree	Overall score
	1	2	3	4	5	
1. Education in medical ethics is important to help practice professionally			2	14	25	<b>4.56</b>
2. I need to learn principles and common aspects of biomedical ethics			1	20	20	<b>4.46</b>
3. I found ethics teaching interesting	3	5	11	18	3	<b>3.33</b>
4. Medical ethics is just common sense	3	14	10	10	3	<b>2.90</b>
5. Topics of the course were relevant to me	1	4	10	19	6	<b>3.63</b>
6. After this course, I found myself more aware of ethical problems		2	7	20	11	<b>4.00</b>
7. Timing of the course is appropriate	2	6	18	12	3	<b>3.20</b>
8. Contents of the course are relevant to my culture	1	4	4	28	2	<b>3.67</b>
9. Assessment method used in the course is appropriate	2	9	15	11	3	<b>3.10</b>

Students' evaluations of the 3 problems used in the problem based learning sessions is shown in Table 3.



**Table 3. Students' evaluation of the 3 problems used in the problem based sessions.**

<b>Problem 1: Radhi's Resentment</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>	<b>Overall score</b>
	1	2	3	4	5	
<b>Amount Learned</b>	2	6	19	7	5	<b>3.18</b>
<b>Relevance in K.S.A.</b>		3	13	12	11	<b>3.79</b>
<b>Stimulating Problem</b>	5	12	9	8	5	<b>2.90</b>

<b>Problem 2: Consent to Omar's treatment</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>	<b>Overall</b>
	1	2	3	4	5	
<b>Amount Learned</b>		6	11	14	8	<b>3.62</b>
<b>Relevance in K.S.A.</b>		4	8	12	15	<b>3.97</b>
<b>Stimulating Problem</b>	2	6	8	15	8	<b>3.54</b>

<b>Problem 3: Abosaleh's terminal illness</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>	<b>Overall</b>
	1	2	3	4	5	
<b>Amount Learned</b>	3	10	6	13	7	<b>3.28</b>
<b>Relevance in K.S.A.</b>	3	2	8	12	14	<b>3.82</b>
<b>Stimulating Problem</b>	9	6	7	8	9	<b>3.05</b>

Table 3 shows that students considered all three problems as good and relevant to the culture, although two of them could have been more stimulating.

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### ***Answers of open-ended questions***

#### *What you have benefited from this course?*

The majority of students felt the benefits of the course. The following quotations are examples of students' perception of benefits:

- "I learned some points that I would not have known without this course"
- "I learned more about principles of medical ethics"
- "I benefited on how to deal with patients and with specific situations"
- "In general I learned a lot about the medical ethics"

#### *How do you think biomedical teaching contributes to your development and growth?*

In general students appreciate the value of ethics teaching in their development and growth. The following comments illustrate some of their responses:

- "As a medical student I think it is crucial to our future"
- "Improve my skills and awareness"
- "It made me stronger and more valued"
- "It opened our minds to some new situations"
- "As much as we get, as much as our brains get mature"
- "In many ways to be a successful doctor"

#### *How do you think Assessment of ethical competences skills should be?*

Most responses suggest a combination of at least two methods such as multiple choice questions, short essay questions and oral examinations.

Examples of students' responses include:

- "I think it should be a little bit easier because it is too early for us to learn such subject"
- "Do not depend in memorizing at all. That most important is understanding and practicing"
- "Only participation and attendance in the lectures"
- "It has to be completely dependent on PBL sessions"
- "The same thing like now"
- "MCQ and Practical"
- "Short essay and MCQs are quite good"

*To teach biomedical ethics, which year of study you think is most appropriate?*

Students have responded “I don’t know” in 10 occasions. But the majority suggested ethics teaching at the last 2 years of the curriculum (20 responses), while the minority suggested early in the curriculum (4 responses) and both in early years as well as later in curriculum (3 responses).

Examples of students’ responses include:

- “The year we start as clinical stuff”
- “First and last year of medicine”
- “Before we go to the hospital”
- “I think it should be two times, one now and other in the last year”
- “Second year and the year before the last year”

*Things you like best about this Block?*

Students have indicated that the Problem-based sessions were the most enjoyable activities of the course. They have also indicated that they like the relevance of the contents and teaching of some of the faculty.

Comments include:

- “The problems were great”
- “About this block I like many things, the best is that most of it’s to topics are related to our future life and all of them are interesting”
- “The high level of the doctors and teachers”
- “Time, slides”
- “ Every thing is ok for me”

## Discussion

In the light of the recent publicity of patient safety and medical errors it is essential to emphasize the importance of medical ethics and make it integral part of our undergraduate education. From personal communications we know that ethics teaching is embedded in most of the undergraduate curricula in Saudi Arabia, but unfortunately no published literature could be found on this vital subject. “Those involved in the delivery of undergraduate ethics teaching perhaps need no convincing of its value in the preparation of tomorrow’s doctors. But how is the subject viewed by the medical students themselves?”<sup>(8)</sup> This study shows that our students strongly value the importance as well as the need for medical ethics for them. This is in accordance with published literature in the west<sup>(8,9)</sup>. Participating students see medical ethics as a subject worth studying and

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understanding and not just as common sense that can be absorbed by default. It is important for the teachers to address this need properly so that future doctors will be enabled well in advance for the ethical dilemmas that they will face in clinical practice.

The majority of the contents of the course is recommended for other curricula<sup>(2,10)</sup>. The majority of participating students agreed that the contents of the course were relevant to them and their culture, but a minority disagreed. This may be due to the fact that students are still not exposed to clinical practice or it may well be due to the failure of faculty in addressing the subject.

As for the benefits of this course, the majority of students felt profited from it. Using open-ended questions to collect qualitative data from students in these aspects give, in our opinion, more weight to their evaluations. Features of ethical problems usually include uncertainty and diversity of both opinions and moral values. In order to value and achieve deep understanding of such issues they should be discussed, challenged and debated among medical students<sup>(10,11,12)</sup>. Students will have the opportunity to interchange and reflect on these issues if they are discussed and presented as clinical problems in PBL sessions. Case-discussion in small groups will enhance a sensitivity to moral aspects, will demonstrate some applications of ethical concepts and will show students some practical difficulties in applying concepts to certain clinical situations<sup>(10,13,14)</sup>.

Students have indicated that medical ethics is best taught at a later stage of the curriculum when they have frequent contacts with patients. This probably will enable students to reflect on the encountered ethical dilemmas and will allow more application of the ethical concepts. During this stage, ethics teaching is expected to be more powerful as students will realize its relevance and would be able to be more reflective on the encountered ethical dilemmas<sup>(8,15)</sup>.

Generally, assessment should be in the form of formative and summative examinations. Techniques for assessment of medical ethics should include assessing cognitive aspects of ethical problems solving, as well as assessing ethical decisions and values<sup>(16,17)</sup>.

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**Box : 1 The questionnaire**

- Do you have any previous exposure to Ethics Teaching?
- Please indicate to which extent you agree in the following:
  1. Education in medical ethics is important to help practice professionally
  2. I need to learn principles and common aspects of biomedical ethics
  3. I found ethics teaching interesting
  4. Medical ethics is just common sense
  5. Topics of the course were relevant to me
  6. After this course, I found myself more aware of ethical problems
  7. Timing of the course is appropriate
  8. Contents of the course are relevant to my culture
  9. Assessment method used in the course is appropriate
- Please rate the used three problems in Problem Based Sessions in relation to:
  1. Amount Learned
  2. Relevance in Saudia Arabia
  3. extent of stimulating discussions
- What you have benefitted from this course?
- How do you think biomedical teaching contribute to you development and growth?
- How do you think Assessment of ethical competences skills should be?
- To teach biomedical ethics, which year of study you think is most appropriate?
- Things you like best about this Block?





Chapter

# 6

**Perception among medical students  
in Riyadh, Saudi Arabia regarding  
alcohol and substance abuse in the  
community:  
a cross-sectional survey**

**Ali I. AlHaqwi**

A slightly different version of this chapter was published as:  
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regarding alcohol and substance abuse in the community: a cross-sectional  
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### Abstract

**Background:** This study was conducted to examine the perception and views of medical students regarding the extent of alcohol and substance abuse in the community and the possible predisposing factors for this problem.

**Methods:** It is a cross-sectional study involving samples from two medical colleges in Riyadh, Saudi Arabia. The students who decided to participate in the study without the offer of any incentives filled in an anonymous, self administered questionnaire which had been designed to meet the purpose of the study.

**Results:** Two hundred and fifteen out of three hundred and thirty students (65% response rate) participated in this study. About 75% of them believe that alcohol and substance abuse is a common problem in the community. Students' views also correspond with the reported view that the problem is mainly present in young adult males. Married males and senior students perceived the problem as more serious than their other colleagues. Students perceived that alcohol was the most commonly abused drug in the community, followed by amphetamines, heroin, cannabis and cocaine. They believe that influence of friends, life stressors, tobacco smoking and curiosity are the most important predisposing factors for abuse of alcohol and other substances. According to the students' perception, the main beneficial effect of alcohol and substance abuse was stress alleviation. About 3% of the students have also indicated that they may use alcohol or some other substance in the future.

**Conclusion:** Despite scarce information on the subject and a strong religious belief in Saudi Arabia against the use of alcohol and other addictive substances, a significant majority of the medical students in Riyadh, the capital of Saudi Arabia, perceived that alcohol and substance abuse is a common problem in the community. Some students appear to perceive the seriousness of the problem less than others. Efforts are needed to educate young men and women at an early stage of their academic life, as a medical student about the existence of this problem in the community, its consequences and predisposing factors. Teaching teenagers and young adults about stress coping strategies may be of special importance in reducing the risk of alcohol and substance abuse.

## Background

Abuse of alcohol and other substances is becoming a considerable health and social problem in the world <sup>(1)</sup>. More than seventy nine thousands deaths are attributed to alcohol in the United States of America (USA) annually, which makes it one of the leading causes of death in that country <sup>(2)</sup>. In the USA, about 8.3% of persons above the age of 12 have indicated using at least an illicit drug in the past month <sup>(3)</sup>.

Moreover, in the USA, substance abuse disorders are expected to increase significantly by 2020 <sup>(4)</sup>. This problem rises significantly in college students, as about 23% of them were found to use substances meeting the criteria of substance abuse and dependence <sup>(5)</sup>.

Studies in Turkey and other parts of the world have shown that excessive alcohol consumption is common among medical students and physicians <sup>(6-8)</sup>. They are at risk of developing serious adverse effects because of their usage <sup>(8)</sup>, which necessitates an urgent call for implementing preventive and counseling programs to reduce alcohol-related harm among college students and other young adults <sup>(9)</sup>.

Despite limited information, alcohol and substance abuse has been confirmed in mainly Muslim countries including Gulf Arab nationals <sup>(10)</sup>. Most commonly abused drugs in these countries are alcohol, heroin and hashish. Available literature demonstrated that substance abuse behavior is even more prevalent among Arab adolescents compared to that of Jewish <sup>(11,12)</sup>.

Consumption of alcohol or other addictive substances is considered as “illegal” in Saudi Arabia, as the law is based on Islamic Sharia rules, which forbid consumption of any amount of alcohol and other forms of substances. Therefore, for religious and legal reasons, any use of alcohol is considered as abuse by Saudi general public.

Information about the extent of this problem in Saudi Arabia is limited. However, statistics of the Ministry of Health in Saudi Arabia showed a substantial increase in specialized psychiatric hospitals outpatient visits and inpatient admission in 2007 compared to 2003 <sup>(13)</sup>.

Some of this increase could be due to problems related to alcohol and substance abuse. In absence of official reports about the magnitude of substance abuse, this could be used as an indirect indicator of the increased demand on such services. Moreover, reports of trafficking of illegal drugs, despite the threats of severe punishment reflect the seriousness of this issue in the country <sup>(14)</sup>.

Attitudes and practices of physicians and future physicians towards alcohol and substance abuse is a topic of significant importance and deserves to be examined.

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Their views will determine the extent of their involvement in the management programs for this serious problem, detrimental to the health of the community.

This study aimed to examine the views and perceptions of medical students about the extent of substance abuse including alcohol in the community and the pre-disposing factors related to this problem.

### Methods

This cross-sectional study was carried out during the month of June 2009 and involved students from two medical colleges in Riyadh, the capital of Saudi Arabia. These two colleges were selected in order to have a homogeneous sample of students as they were the only colleges adopting a "Problem Based Learning" curriculum at the time of the study.

All the students of these two colleges were invited to participate in the study by filling in an anonymous self-administered questionnaire, which was prepared to meet the objectives of this study. The questionnaire included demographic characteristics of students including their study level and GPA. Study level stands for the academic stage of the students which ranges from level 1, junior to level 5, senior level. GPA stands for Grade Point Average, which reflects the academic performance of students.

The questionnaire included as well students' opinion if they perceived that substance abuse and alcohol use is a common problem in the community, their views of commonly abused drugs, the predisposing factors and the beneficial effects of substances if any, and whether they thought that they might use alcohol or other substances in the future. The questionnaire was constructed utilizing some available published data <sup>(15-17)</sup>, which was further piloted among 10 students to determine clarity of questions to students. Some questions were modified according to students' comments.

The questionnaire was mailed to all students of the two medical colleges. Personal information that could reveal students' identity including name and number was not required. This was to ensure confidentiality and to encourage more participation and expression of opinions. Students were instructed to return the questionnaire to the author through post mail.

Data was coded, entered and analyzed using the Statistical Package for Social Sciences (SPSS), version <sup>(17)</sup>. A descriptive analysis was done to summarize information. This was done by calculating the number and percentage for categorical variables, whereas the mean and standard deviation (SD) was calculated for continuous variables. Chi-square tests were used to test

significance between variables. Moreover, Jonckheere-Terpstra test was used to assess association between categorical variables and the ordinal variables for the opinion. Similarly, the Spearman correlation was used to assess the association between the continuous variables and the ordinal variables for the opinion. A *p*-value less than 0.05 was considered statistically significant.

The proposal of this study was reviewed and approved by the research ethics committee at the King Abdullah International Research Center.

## Results

A total number of 215 out of 330 students participated in this study, which makes a response rate of 65%. The mean age of the participants was 21 years ( $\pm$  3 SD). Male students constituted 77% and more than 90% were single. Other characteristics of the study sample are shown in Table 1.

**Table 1. Characteristics of the participants**

	Number	Percentage %
Sex		
Male	165	77
Female	50	23
Marital Status		
Single	200	93
Married	15	7
Study Level		
1	86	40
2	35	17
3	27	13
4	46	22
5	17	8
GPA		
Excellent	49	23
Very Good	78	36
Good	54	25
Fair	16	7

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Table 2 shows that more than 75% of the participants perceived that alcohol use and substance abuse is a real problem in Saudi community and about 15% could not determine if this problem existed or not. The majority of the participants believed that substance abuse is a problem of young males of the 15-30 years age group.

**Table 2. Students' awareness of substance abuse as a problem and some of its features**

	Frequency	Percent %
Substance abuse is a common problem in Saudi community		
• Strongly Agree	69	32%
• Agree	95	44%
• Disagree	7	3.2%
• Strongly Agree	4	2%
• Don't Know	31	14.4%
• Unavailable Data	9	5%
Substance abuse affects mainly the following age group:		
• <15	19	9%
• 15-30	167	77.3%
• 30-45	4	2%
• >45	1	1%
• Unavailable Data	24	11%
Substance abuse affects mainly:		
• Males	179	83%
• Females	3	1.4%
• Don't Know	24	11.10%
• Unavailable Data	9	5%

The effect of students' characteristics in their opinions of the magnitude of the problem is shown in Table 3. Males and married students think that the problem of substance abuse is more common *than* their other colleagues (Jonckheere-Terpstra  $z = 3.28$ ,  $p < 0.001$  and  $z = 3.97$ ,  $p < 0.0001$ , respectively). Perceived magnitude of a substance abuse problem was also significantly correlated with study year (Spearman  $r = 0.46$ ,  $p < 0.0001$ ) and GPA (Spearman  $r = 0.15$ ,  $p < 0.05$ ).

The majority of the students perceive that alcohol is the most commonly drug of abuse in the community, followed by amphetamines, heroin, cannabis and cocaine.

**Table 3. Students' perception of substance abuse as a problem and students characteristics**

Opinion											
	Strongly Agree		Agree		Disagree		Strongly Disagree		Don't Know ¥		Total
	N	%	N	%	N	%	N	%	N	%	
Sex§											
Male	58	36	79	50	2	1.25	1	0.6	20	12.5	160*
Female	11	24	16	34	5	11	3	6.2	11	24	46
											206
Marital Status§											
Single	57	30	93	49	6	3	4	2	31	16	191
Married	12	86	2	14	0	0	0	0	0	0	14*
											205
Study Level¶											
1	17	21	29	36	6	7.5	4	5	24	30	80
2	4	12	24	70	1	3	0	0	5	15	34
3	15	54	13	46	0	0	0	0	0	0	28
4	21	75	23	82	0	0	0	0	1	2	45*
5	12	75	4	25	0	0	0	0	0	0	16*
											203
GPA¶											
Excellent	10	22	20	43	2	4	1	2	13	28	46
Very good	24	31	41	53	2	3	2	3	8	10	77
Good	24	46	23	44	2	4	1	2	2	4	52
Fair	4	27	4	27	1	6	0	0	6	40	15
											190

\*: p-value statistically significant

¥: This response was taken as "neither agree nor disagree"

§: Jonckheere-Terpstra test was used to assess significance

¶: Spearman correlation was used to assess significance

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They believe that influence of friends is the most important predisposing factor leading to abuse of alcohol and other substances, followed by life stresses, tobacco smoking and the curiosity related to experimentation. The factors that had the least contribution to substance abuse, in their views were physical diseases and inadequate recreational facilities, as shown in Table 4.

About a third of the participants indicated that abuse of alcohol and other substances could have some beneficial effect in the form of alleviation of stress. However, students generally believed that overall there are very little benefits, if any with substance abuse.

About 70% of the participants indicated that they don't intend to use alcohol or other substances in the future, and about 27% were not sure about their future intentions. About 3% of the students indicated that they might use alcohol or other substances in the future.

**Table 4. Perceived risk and protective factors for substance use**

<b>Factors</b>	<b>Frequency</b>	<b>Percent (%)</b>
Friends	171	79.2%
Life Stress	129	60%
Tobacco Smoking	125	58%
Curiosity / for experimentation	124	57.4%
Living away from home	119	55.1%
Psychological diseases	117	54.2%
Social reasons	115	53.2%
Family Members	109	51%
Study stress including exams	101	47%
Lack of knowledge of harmful effects	100	46.3%
Religious/Moral unacceptability	87	40.3%
Inadequate recreational facilities	66	31%
Physical diseases	50	23.1%



## Discussion

The religious and legal rules in Saudi Arabia forbid consumption of any amount of alcohol and other forms of substances. Despite this fact, about three quarter of medical students in this study have the perception that alcohol and substance abuse is a real problem in the community. This view could be based on the encountered experiences of substance related problems of abuse in the community which may be a result of recent socioeconomic and rapid lifestyle changes, especially in the younger section of the Saudi population. However, lack of enough dissemination of information on this issue might explain that a considerable percentage of medical students could not indicate whether alcohol and substance abuse is a common problem in the community or not.

Most of the medical students have indicated that the substance abuse is a behavior usually practiced by young adult males. This is in-keeping with the available descriptive statistics from studies of substance abuse behavior in Saudi Arabia <sup>(18, 19)</sup>.

The view of students about presence of substance abuse in the community was shown to be highly affected by their gender, marital status and level of study i.e.: being a married male at a senior level of study. This probably raises the need of educating other subgroups of students, especially junior and female students to gain more insight into the problem at an earlier stage of their career.

Alcohol, amphetamines, heroin and cannabis were thought to be the most frequently abused substances in the community. This view corresponds with that of primary care physicians in Saudi Arabia in considering alcohol as the most commonly abused substance <sup>(15)</sup>. It has also been reported that alcohol abuse is the main substance abuse forms in addiction centers and specialized psychiatric centers in Saudi Arabia <sup>(18)</sup>. Moreover, it has been noticed that the trend of abusing amphetamines and cannabis is on the rise <sup>(19)</sup>.

Friends and peer pressure, life stresses, tobacco smoking and curiosity were felt to be the main factors that may predispose to alcohol and other substance abuse.

Peer pressure and curiosity were also found to be important reasons of initiating drug use in a published study <sup>(20)</sup>. This initiation and experimentation of substance as a result of curiosity and peer influence might lead to abuse and dependence later in life. One twin study points to the contribution of environmental factors on the transition from early alcohol use to alcohol or other substance abuse and dependence <sup>(21)</sup>.

General life stresses and those especially associated with the study of medicine should be treated carefully as they could affect the general well-being of medical

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students and their academic performance and may lead to some form of alcohol or substance abuse <sup>(13,22,23)</sup>.

Interestingly, more than a third of students indicated that alcohol and other substances could have a beneficial effect as stress alleviation, which is similar to that found in a survey of

## Conclusion

Despite scarce information on the subject and a strong religious belief in Saudi Arabia that forbids the use of alcohol and other addictive substances, medical students think that alcohol and substance abuse is a common problem in the community. The awareness of some students appears to be less than others. Efforts are needed to educate medical students at an early stage of their study about the problems, its consequences and predisposing factors. Teaching and training students to use stress coping strategies may be of special importance to reduce the risk of alcohol and substance abuse.

## Recommendations

Based on the findings of this study, the following recommendations are suggested to policy makers:

1. Awareness programs for medical college students and other youth groups about the hazard of alcohol and other substances abuse are badly needed.
2. Special emphasis should be made for teaching certain issues such as the role of tobacco smoking, peer influence and life stressors that are predisposing factors for the alcohol and substance abuse problems.
3. Counseling programs should be implemented to support students, especially during difficult periods of their study of medicine.
4. Multiple and regular “stress coping strategies” sessions could be organized for medical students to help them to cope with life stressors and to minimize the possibility of use of alcohol or other substances.

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## Chapter

# 7

### **Knowledge, attitude and practice of tobacco smoking by medical students in Riyadh, Saudi Arabia**

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### Abstract

**Background:** Tobacco consumption is associated with considerable negative impact on health. Health professionals, including future doctors, should have a leading role in combating smoking in the community.

**Objectives:** The aims of the study were to assess the prevalence of smoking among medical students of newly established medical colleges in Riyadh City, the capital of Saudi Arabia, as well as to assess students' attitude, practice and their knowledge on the risk factors of tobacco consumption.

**Methods:** A cross-sectional, questionnaire-based study of students from two medical colleges in Riyadh, Saudi Arabia was carried out. The questionnaire used was anonymous, self-administered and developed mainly from Global Adult Tobacco Survey (GATS).

**Results:** A total of 215 students participated in this study. Forty students (19%) indicated that they smoke tobacco at the time of the study. All of them were males, which raises the prevalence among male students to 24%. Tobacco smoking was practiced by males more than females ( $p$  value  $< 0.0001$ ) and by senior more than junior students ( $p < 0.0001$ ). About 94% of the study sample indicated that smoking could cause serious illnesses. About 90% of the students indicated that they would advice their patients to quit smoking in the future and 88% thought that smoking should be banned in public areas. Forty-four students (20%) thought that smoking has some beneficial effects, mainly as a coping strategy for stress alleviation.

**Conclusion:** Despite good knowledge about the hazards of tobacco consumption, about 25% of the medical students in this study continue to smoke. The main reported reasons should be addressed urgently by policy-makers. Special efforts should be taken to educate medical students on the effective strategies in managing stress during their study as they thought that tobacco smoking could be used as a coping strategy to face such a stress.



The general negative impact of tobacco smoking on health is significant. Currently, the mortality due to tobacco smoking has been estimated to be more than 5 million deaths annually <sup>(1)</sup>, which is expected to double by 2020 <sup>(2)</sup>. This significant impact is not only due to morbidity and mortality, but also attributed to the social and the economic cost of smoking <sup>(3)</sup>. Reports have indicated that the real impact of tobacco smoking could be underestimated because of high level of exposure of “secondhand” smoke, increased smoking among youths and the increase in smoking among nonsmokers <sup>(4)</sup>.

An international review showed that the prevalence of tobacco smoking varies greatly among medical students from one country to another. Its prevalence varies among male medical students from 3% in the United States to 53% in Japan <sup>(5)</sup>. To a lesser extent, variation has been reported regionally. Smoking ranges from 15% to 35% in three different regional studies among university students <sup>(6-8)</sup>. In Saudi Arabia, the overall prevalence of smoking in both the general population and university students, ranges from 21% to 25% <sup>(9-11)</sup>. Tobacco smoking was reported to be practiced by approximately 13% of male medical students <sup>(12,13)</sup>. To the best of the authors' knowledge, there are no published data about smoking among students of the newly established medical colleges that adopted a Problem Based Learning curriculum.

The health professionals, including future doctors, play an important role in educating patients about the hazards of tobacco smoking, providing advice, support and motivation to patients to quit smoking. Thus, their views and attitude are of great importance to be determined before implementing any anti-tobacco measures. This study was carried out to determine the prevalence of smoking among medical students from newly established colleges in Riyadh City, the capital of Saudi Arabia. Students' attitude, practice and their knowledge of the risk factors of tobacco consumption were also sought.

# Methods

This is a cross-sectional study which was carried out during the month of June 2009 and involved students from two medical colleges in Riyadh, the capital of Saudi Arabia.

These two colleges were selected in order to have a homogeneous sample of students as they were the only colleges adopting a "Problem Based Learning" curriculum at the time of the study. All the students of these two colleges were invited to participate in the study by filling in an anonymous self-administered questionnaire.

A questionnaire was developed mainly based on the Global Adult Tobacco Survey (GATS) and was used in our study. This instrument aims to assess main issues related to tobacco consumption, which has been developed and validated by collaboration of Centers of Disease Control and Prevention (CDC), World Health Organization, CDC Foundations, John Hopkins Bloomberg School of Public Health (JHSPH) and Research Triangle Institute (RTI) <sup>(14)</sup>.

The questionnaire was written in English and includes information about demographic data of participants including their study level and GPA. Study level stands for the academic stage of the students which ranges from level 11, junior to level 5, and senior level. GPA stands for Grade Point Average, which reflects the academic performance of students.

The questionnaire included as well information about students' smoking practices, their knowledge and attitude toward smoking. In order to achieve the highest possible accuracy, participation in this study was voluntary and the questionnaire was anonymous and self-administered.

For the purpose of this study, smoking status was defined as regular or occasional cigarette or water pipe smoking at the time of the study. Nonsmokers are those who never smoke or were ex-smokers.

Data was coded, entered and analyzed using the Statistical Package for Social Sciences (SPSS), version <sup>(17)</sup>. Descriptive analyses were done to summarize information by calculating the number and percentzge for categorical variables, whereas the mean and standard deviation (s.d.) were calculated for continuous variables. Chi-squared tests were used to measure differences in the prevalence of smoking between different groups of students. A *p* value less than 0.05 was considered statistically significant.

The proposal of this study had been revised and approved by the ethics committee of King Abdullah International Research Center.

## Results

A total number of 215 out of 330 students participated in this study, which makes a response rate of 65%. The mean age of the participants was 21 years (s.d. = 3). Male students represented 77% and more than 90% were single. Other characteristics of the study sample are shown in Table 1.

**Table 1. Characteristics of participants**

		Number ( <i>n</i> )	Percentage (%)
Sex	Male	165	77
	Female	50	23
Marital status	Single	200	93
	Married	15	7
Study level	1	86	40
	2	35	17
	3	27	13
	4	46	22
	5	17	8
GPA	Excellent	49	23
	Very good	78	36
	Good	54	25
	Fair	16	7

Forty students (19%) indicated that they used to smoke tobacco at the time of the study. All of them were males, which raised the prevalence among male students to 24%. The differences between characteristics of smokers and nonsmokers are shown in Table 2.

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**Table 2. Association between students' characteristics and smoking status**

		Smokers <i>n</i> (%)	Nonsmokers <i>n</i> (%)	<i>P</i> value
Sex	Male	40 (24)	125 (76)	<0.0001
	Female	0 (0)	50 (100)	
Marital status	Single	36 (18)	163 (82)	0.41
	Married	4 (27)	11 (73)	
Study level	1	8 (9)	78 (91)	<0.0001
	2	2 (6)	33 (94)	
	3	8 (7)	19 (93)	
	4	13 (28)	33 (72)	
	5	9 (53)	8 (17)	
GPA	Excellent	6 (12)	43 (82)	0.477
	Very good	16 (21)	62 (79)	
	Good	14 (26)	40 (74)	
	Fair	2 (13)	14 (16)	

Tobacco smoking was practiced by males more than females ( $p$  value < 0.0001) and by senior students more than junior students ( $p$  < 0.0001).

About 94% of the study sample indicated that smoking could cause serious illnesses. The students also indicated, as shown in Table 3, that smoking is related to major chronic diseases, especially lung cancer and heart diseases, but to a lesser extent, to sexual dysfunction, as approximately a third of the students did not know if smoking could cause any sexual dysfunctions.

**Table 3. Students' responses to the relationships between smoking and certain diseases**

Diseases	Yes <i>n</i> (%)	No <i>n</i> (%)	Don't know <i>n</i> (%)
Stroke	180 (83)	5 (2)	27 (13)
Heart diseases	192 (89)	4 (2)	17 (8)
Lung cancer	202 (94)	3 (1.4)	8 (4)
Gum diseases	182 (84)	5 (2)	25 (12)
Hypertension	173 (80)	10 (5)	26 (12)
Sexual dysfunction	126 (58)	21 (10)	62 (29)

About 90% of the students indicated that they would advise their patients to quit smoking in the future, and 88% thought that smoking should be banned in public areas.

The influence of friends and peer pressure was perceived as the main reason for smoking as shown in Table 4, followed by stress and the effect of promoting smoking through media.

**Table 4. Students' perception on the main causes of smoking**

	Responses	
	Number (n)	Percentage (%)
Friends	164	80
Stress	56	26
Media	29	13

Forty-four students (20%) thought that smoking has some beneficial effects. The main effect was related the use of smoking as a coping strategy for stress alleviation. Moreover, students thought that smoking plays a role in preventing some diseases like Parkinsonism and viral diseases. Other perceived benefits of smoking are shown in Table 5.

The practice of smoking was higher among males with a significant statistical difference. Tobacco smoking was practiced by males more than females ( $P$  value  $< 0.0001$ ) and by senior students more than junior students ( $< 0.0001$ ).

About 94% of the study sample indicated that smoking could cause serious illnesses. The students also indicated, as shown in Table 3, that smoking is related to major chronic diseases, especially lung cancer and heart diseases, but to a lesser extent, to sexual dysfunction, as approximately a third of the students did not know if smoking could cause any sexual dysfunctions.

About 90% of the students indicated that they would advise their patients to quit smoking in the future, and 88% thought that smoking should be banned in public areas.

The influence of friends and peer pressure was perceived as the main reason for smoking as shown in Table 4, followed by stress and the effect of promoting smoking through media.

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alleviation. Moreover, students thought that smoking plays a role in preventing some diseases like Parkinsonism and viral diseases. Other perceived benefits of smoking are shown in Table 5.

**Table 5. Benefits of smoking**

	Responses	
	Number (N)	Percentage (%)
Relief stress	24	69
Protect against some diseases	5	14
Increase concentration	3	8
Social benefits	3	8

## Discussion

Health professionals, including future doctors, have a leading role in combating smoking in the community. Thus, it is of great importance to determine their views and attitude toward this problem.

This study has demonstrated that the prevalence of smoking among medical students is 19% and rises to reach up to 24% among males. The prevalence of smoking among students of newly established problem based medical colleges was comparable to that of previously reported data among students of colleges adopting traditional medical curriculums <sup>(7,13,14)</sup>.

It has been reported that compared to conventional teaching methods, Problem Based Learning particularly promotes students' active learning, interpersonal skills and problem solving abilities <sup>(15)</sup>. In addition to this, Problem Based learning increases students' motivation and enjoyment <sup>(16)</sup>. Such advantages of Problem Based Learning are expected to make students less stressed and less involved in stress-related behaviors like tobacco smoking.

The findings of this study confirm similar smoking prevalence among students of newly established medical colleges, and their colleagues from other medical colleges.

Tobacco smoking was found to be significantly higher among senior students compared to those in the first 2 years. Similar findings have been reported <sup>(8-10,17)</sup>, as the risk of tobacco consumption increases with students' progression. This is probably due to increased stress faced by the students with their progression, over the years. There was no effect of marital status and academic achievements

on tobacco use in this study; however, other studies showed that single and poor performing students tend to smoke more <sup>(8)</sup>.

Students showed high awareness of the hazards of smoking especially in relation to the significant role of smoking in lung cancer and cardiovascular diseases. Students appreciated the risks of passive smoking and agreed with the decisions of banning it in public areas. They also have indicated their willingness in taking a positive and active role to reduce the tobacco consumption of their future patients.

The effect of the influence of peers as a major determinant of tobacco smoking was comparable to that reported in regional and local studies <sup>(6,14)</sup>. Students indicated that tobacco is consumed to overcome the stress experienced during their studies. The influence of peers and the role of life-stressors in general are particularly important as they were perceived by medical students to contribute to more serious behaviors such as alcohol and substance use and abuse <sup>(18)</sup>. This finding should be taken very seriously as students use tobacco smoking as a stress coping strategy.

In conclusion, despite good knowledge on the hazards of tobacco consumption, about 25% of the medical students in this study continue to smoke. The main reasons reported are due to peers pressure and stress. This is supported by the finding of this study that the prevalence of tobacco consumption is significantly higher among senior students.

However, students showed a positive attitude toward minimizing passive smoking through their support of banning smoking in public areas as well as their willingness to discuss and advise their patients to quit smoking. Given their vital role as future physicians and role models, more effective approaches to help reduce tobacco consumption among medical students are needed. Efforts should be taken to educate medical students on effective strategies in managing stress during their course, as they thought that tobacco smoking could be used as a coping strategy to face such stress. In this regard, multiple and regular “stress coping strategies” sessions could be organized for medical students to help them to cope with life stressors and to minimize the possibility of smoking and probably more serious behaviors such as use of alcohol or other substances. It may be appropriate to consider implementing counseling programs to support students, especially during difficult periods of their medical course.

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Chapter

# 8

## **Summary and General Conclusions**

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### Objectives of the dissertation

Undergraduate medical education has witnessed a tremendous development in Saudi Arabia over the last four decades. The number of the medical colleges was increased from 3 in 1967 to 21 in 2010. In addition, an accreditation system, in the form of a National commission for academic accreditation and assessment, has been established to monitor and evaluate the quality of postgraduate education. Despite this, recent criticisms have been raised about the quality of the undergraduate medical education in Saudi Arabia. Details are provided in Chapter 1.

The first objective of the dissertation was to present an overview of the literature concerning the factors that influence the effectiveness of the clerkships in undergraduate medical education and that contribute to the development of clinical competence of medical students (Chapter 2). The second objective was to investigate the perception of medical students and teachers in Saudi Arabia concerning the determinants of the effectiveness of clinical learning (Chapter 3). The third objective was to develop a new instrument to evaluate the quality of the clinical learning: The Clinical Learning Evaluation Questionnaire (CLEQ) (Chapter 4). The fourth objective of this dissertation was to study students' evaluation of their exposure to the teaching of ethics (Chapter 5). The fifth objective of this dissertation was to study the perception of undergraduate medical students in Saudi Arabia regarding alcohol and substance use in the community (Chapter 6). The sixth objective was to study the knowledge, attitude and practice of Tobacco smoking by medical students in Saudi Arabia (Chapter 7). Below we summarize the main findings of our six studies.

### Achieving Clinical Competence: Literature Review (Chapter 2)

The review of relevant literature about the influencing factors on the effectiveness of clinical teaching and learning showed that students should be exposed as early as possible to clinical situations as this approach will enhance students' satisfaction and will help them to develop their professional identity. Clinical skills teaching has been conducted in both ambulatory care and inpatients settings. Perceived advantages of hospital-based learning include: management of acute medical conditions and gaining experiences of procedures and investigations. On the other hand, community-based learning is perceived as particularly appropriate to learning patient-centered approaches to care and improving communication skills. The combination of teaching in these two sites is likely to provide the most balanced exposure to medical students.

There are many factors that influence the quality of student learning in these settings. They include number of patients and varieties of pathologies (patient mix) seen by students, quality of supervision and feedback, students relationships with faculty, and organization of teaching. Interestingly the vital

role of supervision was especially apparent with a limited patient mix. This emphasizes the fundamental role of supervision in compensating for the gaps in students' learning opportunities. The amount of clinical training and time spent on medical tasks are other identified factors that contribute to the development of diagnostic accuracy of medical students.

Students' learning could be facilitated or obstructed by many factors. Facilitating factors include: allowing students to take more responsibilities in patient care, student independence, opportunities to practice different tasks, and receiving feedback. Other apparent promoting factors include awareness of the situation and understanding of the "whole picture." Students' learning could be obstructed by factors such as less reliance on students, lack of continuity of supervision, and lack of opportunity to practice.

Clinical supervision has a vital role in undergraduate and postgraduate education. Indeed, characteristics of effective supervision include offering constructive, structured, frequent, and regular feedback sessions. In addition to clinical management, supervision should include teaching and research, personal and professional development, and reflection. It has also been shown that direct observation of students and working together with supervisors positively affect patients outcomes. The quality of the supervisory relationship is probably the single most important factor for the effectiveness of supervision, more important than the method of supervision used. Learners have indicated that respecting their autonomy and allowing independence are other important characteristics of an effective clinical teacher.

### **Determinants of Effective Clinical Learning. A Student and Teacher Perspective in Saudi Arabia (Chapter 3)**

Concerning the second objective, a qualitative study using focus group interviews, was conducted to explore the perception of undergraduate medical students and teachers regarding the features of clinical experiences that enhance the clinical learning. Five main themes were identified for the experiences and activities that students considered as contributing 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. The five main themes are further divided into sub-themes to elucidate specific component themes within each theme. 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.

The findings of the literature review (Chapter 2) and the qualitative study presented in Chapter 3 were utilized in the development of a new instrument

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to evaluate the quality of undergraduate clinical education, the third objective of this dissertation.

### **Development and factor structure, reliability and validity of the Clinical Learning Evaluation Questionnaire (CLEQ) for undergraduate clinical education (Chapter 4)**

The third objective was the development of a new instrument to evaluate the quality of the clinical learning: The Clinical Learning Evaluation Questionnaire (CLEQ). The first version of the CLEQ was composed of 40 items which aim to explore five main areas that may influence students' clinical learning (see Chapter 3). Those areas are: provision of clinical cases (6 items), authenticity of clinical experiences (9 items), supervision (7 items), organization of the doctor-patient encounters (11 items), and motivation of students for their learning (7 items). This instrument was applied in 3 medical schools in Riyadh and tested on 109 students.

The factor analysis of the CLEQ supported the previous five factors and yielded a new, sixth, factor. These six factors are: F1 Cases (8 items), F2 Authenticity of clinical experience (8 items), F3 Supervision (8 items), F4 Organization of the doctor-patient encounter (4 items), F5 Motivation to learn (5 items), and F6 Self awareness (4 items).

The overall internal consistency ( $\alpha$ ) of the CLEQ was 0.88, and the reliabilities (Cronbach's  $\alpha$ ) of the six factors varied from .60 to .86. Hypotheses concerning the correlations between the different factors were partly confirmed, which supported the convergent validity of the factors but not their divergent validity. Significant differences were found between the scores of the students of the three different schools on the factors Supervision and Organization of patient-doctor encounter. The results of this study demonstrated that CLEQ is a multidimensional and reliable instrument. The CLEQ is meant to be used in medical undergraduate programs, and results from it can be informative both for the staff that is responsible for the quality of the clinical rotations and for the students themselves. It can be utilized as well as an evaluation tool for clinical teaching activities, both by educators and students. However, more research is needed into the validity of the CLEQ.

### **Medical Student's Evaluation of their First Ethics Teaching Exposure (Chapter 5)**

Regarding the fourth objective, the current Biomedical Ethics Course offered at the College of Medicine-King Saud bin Abdul-Aziz University for Health Sciences (KSAU-HS) was reviewed. This review includes the content, process and assessment of biomedical ethics teaching. Students' evaluation about their exposure to ethics teaching was assessed as well. This study shows that students

strongly value the importance as well as the need for medical ethics for their future professional practice. The majority of students agreed that the contents of the course were relevant to them and their culture. Students have indicated that medical ethics is best taught at a later stage of the curriculum when they have frequent contacts with patients. This probably will enable students to reflect on the encountered ethical dilemmas and will allow more application of the ethical concepts. Assessment should be in the form of formative and summative tests. Techniques for assessment of medical ethics should include assessing cognitive aspects of ethical problems solving, as well as assessing ethical decisions and values.

### **Perception among medical students in Riyadh, Saudi Arabia regarding alcohol and substance abuse in the community: a cross-sectional survey (Chapter 6)**

Regarding the fifth objective, the perception of undergraduate medical students regarding the problem of substance abuse in the community was explored. Consumption of alcohol and other addictive substances is considered as “illegal” in Saudi Arabia, as the law is based on Islamic Sharia rules, which forbid consumption of any amount of alcohol and other form of substances. So, for religious and legal reasons, any use of alcohol is considered as abuse by Saudi general public. Despite limited available information about the extent of this problem in Saudi Arabia, reports of trafficking of illegal drugs reflect the seriousness of this issue in the country. The majority of students in this study believe that alcohol and substance abuse is a common problem in the community. Students perceived that alcohol was the most common abused drug in the community, followed by amphetamine, heroin, cannabis and cocaine. They believe that the influence of friends, life stressors, tobacco smoking and curiosity are the most important predisposing factors for abuse of alcohol and other substances. According to students’ perception, the main beneficial effect of alcohol abuse was stress alleviation. About 3% of the students have also indicated that they may use alcohol or some other substances in the future. Efforts are needed to educate medical students at an early stage of their study about the problems of substance abuse, their sequences and predisposing factors. Teaching and training students stress coping strategies, in particular, may be of special importance to reduce the risk of alcohol and substance abuse.

### **Knowledge, attitude and practice of tobacco smoking by medical students in Riyadh, Saudi Arabia (Chapter 7)**

The sixth objective was to study the knowledge, attitude and practice of tobacco smoking by medical students in Saudi Arabia. Tobacco consumption is associated with a considerable negative impact on health. Health professionals, including future doctors, should have a leading role in combating smoking in the community.

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Despite good knowledge about the hazards of tobacco consumption, about 25% of the medical students in this study continued to smoke.

The main reported reasons should be addressed urgently by policy-makers. Special efforts should be taken to educate medical students on the effective strategies in managing stress during their study as they thought that tobacco smoking could be used as a coping strategy to face such a stress.

### Discussion and conclusion

Based on the literature review and the qualitative study in chapters 1 & 2, the Clinical Learning Evaluation Questionnaire (CLEQ) was developed and tested in chapter 3. The study showed that the CLEQ is a reliable and partly valid tool that could be utilized to assess the quality of clinical education for undergraduate medical students.

The teaching of biomedical ethics should be integrated in the undergraduate medical curriculum. Students felt that biomedical ethics teaching should be introduced early in the curriculum and that this subject should be revisited at a later stage with more orientation to common problems that are usually faced during clinical practice.

Students perceived that substance abuse is quite common in the community and about 3% of them have indicated that they may abuse alcohol or other addictive substance in future. About a quarter of them smoke tobacco. Students have indicated that tobacco smoking and use of alcohol and other substance could be caused by stress that they faced during their study. In this regard, multiple and regular “stress coping strategies” sessions could be organized for medical students to help them to cope with life stressors and to minimize the possibility of smoking and probably more serious behaviors such as use of alcohol or other substances. Counseling programs should be implemented to support students, especially during difficult periods of their study of medicine. Multiple and regular “stress coping strategies” sessions could be organized for medical students to help them to cope with life stressors and to minimize the possibility of use of alcohol or other substances.

### Suggestions for future research

Although the study in Chapter 3 showed that the CLEQ is a multidimensional and reliable tool that could be utilized in the evaluation of the effectiveness of clinical education, further research work is needed to evaluate the construct validity of the CLEQ. This could be assessed by using objective measures that evaluate the components of the CLEQ and compare them with that obtained by the use of the CLEQ. These additional works will hopefully support further the validity of the CLEQ, particularly the divergent validity.



Another recommendation is to study the appropriateness and generalizability of the CLEQ in evaluating clinical teaching settings, inside and outside Saudi Arabia. Introducing and evaluating new innovations in teaching biomedical ethics for undergraduate medical students are needed. Such innovations are the utilizing of new instructional methods as Problem Based Learning, and presentation and discussion of real ethical dilemmas.

As about 3% of students have indicated their potential abuse for alcohol and other substance in future, further studies are required to indicate the extent of alcohol and other addictive substance use among undergraduate medical students. Appropriate implementation of effective control measures and strategies of alcohol and substance abuse require having enough knowledge of the extent of this problem among undergraduate medical students.



# **Summary and General Conclusions in Arabic**

**الخلاصة والتوصيات**

## أهداف الرسالة

شهد التعليم الجامعي لدراسة الطب تطوراً كبيراً خلال العقود الأربعة الأخيرة في المملكة العربية السعودية حيث زاد عدد كليات الطب من ثلاث كليات فقط في عام ١٩٦٧ حتى أصبح إحدى وعشرين كلية في عام ٢٠١٠. هذا بالإضافة إلى إنشاء نظام للتقييم والاعتماد لجودة التعليم الجامعي يتمثل في الهيئة الوطنية للاعتماد والتقييم الأكاديمي. وبالرغم من كل هذه التطورات الكبيرة فإنه ما يزال هناك بعض الانتقادات لجوانب متعددة لاداء وجودة التعليم الطبي في المملكة العربية السعودية. المزيد من التفاصيل موجودة في (الفصل الأول) من هذه الرسالة.

الهدف الأول من هذه الرسالة هو اجراء مراجعة مستفيضة للدراسات والبحوث المتعلقة بالعوامل المؤثرة في جودة وفعالية التعلم السريري لطلاب كلية الطب والتي تساهم في تطور مهاراتهم السريرية والأكلينيكية (الفصل الثاني). الهدف الثاني من هذه الرسالة هو بحث واستطلاع آراء ووجهات نظر طلاب الطب والمدرسين الأكلينيكين في كليات الطب في المملكة العربية السعودية بخصوص محددات التعلم الأكلينيكي (الفصل الثالث).

أما الهدف الثالث فهو اعداد اداة جديدة لتقييم جودة وفعالية التعلم والتدريب الأكلينيكي وقد تم تسمية هذه الأداة: استبانة تقييم التعلم الأكلينيكي (الفصل الرابع). أما الهدف الرابع فكان دراسة واستيضاح تقييم طلاب كلية الطب لدراستهم اخلاقيات المهنة الطبية (الفصل الخامس).

وكان الهدف الخامس لهذه الرسالة هو دراسة آراء وانطباعات طلاب كلية الطب حول مشكلة تعاطي الكحول والمواد المخدرة في المجتمع السعودي (الفصل السادس). سادس اهداف الرسالة يتمثل في دراسة معلومات طلاب كلية الطب في المملكة العربية السعودية ومواقفهم وممارستهم لتدخين التبغ (الفصل السابع).

وفيما يلي خلاصة للنتائج الرئيسة لهذه الدراسات الست.

## (الفصل الثاني) نحو تحقيق الكفاءة الأكاديمية: مراجعة بحثية

بمراجعة البحوث والأدبيات المتعلقة بالعوامل المؤثرة في عملية التعلم والتدريب الطبي اتضح ان البدء في تدريب طلاب كلية الطب على المهارات الاكلينيكية في مراحل مبكرة من الدراسة يساهم في زيادة رضى الطلاب ويساعدهم على ايجاد وتنمية شخصيتهم المهنية.

ان تدريس المهارات الاكلينيكية يتم عادة في الأقسام الداخلية للمستشفيات وكذلك عيادات طب الأسرة والمجتمع ولكل من هذين الجهتين ايجابياتها المعتبرة. فمن ايجابيات التعلم في أقسام المستشفيات الداخلية: معاينة وعلاج الحالات الطبية الطارئة وكسب مهارات العمليات الصغرى واجراء الفحوصات المتخصصة. وفي المقابل فان دراسة الطلاب في مراكز طب الأسرة والمجتمع يدعم جوانب التعلم المتعلقة بالمريض واكتساب مهارات التواصل. ان اعطاء الفرصة للطلاب للتعلم في اقسام المستشفى الداخلية وكذلك في أقسام طب الأسرة والمجتمع يعتبر الأسلوب الأمثل للتعلم الأكاديمي.

كما اتضح من خلال المراجعة أن هناك العديد من العوامل التي تؤثر في جودة التعلم الأكاديمي لدى الطلاب. من هذه العوامل: عدد المرضى التي يتم معاينتها من قبل الطلاب وتنوع حالاتهم المرضية، جودة الاشراف والتغذية الراجعة، علاقة الطلاب بالمدرسين والمشرفين، والجوانب التنظيمية للعملية التدريبية. ومما يثير الاهتمام فأن دور المدرسين من خلال الاشراف الفعال يتضح وبجلاء في حالة قلة عدد وتنوع الحالات المرضية الأمر الذي يعزز من اهمية دور الاشراف في ردم الهوة بين احتياجات الطلاب والفرص التعليمية المتاحة. كما أن مقدار الوقت المبذول في التدريب يعتبر أحد العوامل المعتبرة في تطوير ودقة المهارات المتعلقة بكفاءة القدرات التشخيصية للطلاب.

كما اتضح من خلال مراجعة الأدبيات الطبية أن تعلم طلاب الطب يمكن تعزيزه أو عاقته بعدة عوامل. حيث تشمل العوامل المعززة: تمكين الطلاب لأخذ مهام أكثر في رعاية المريض، اعطاء الطلاب صلاحيات أكبر. السماح بممارسة مهام مختلفة

واعطاء الطلاب تغذية راجعة فعالة.

كما أن العوامل المعيقة تشمل: عدم الاعتماد على الطلاب في رعاية المرضى، عدم وجود أو استمرار الاشراف الفعال وكذلك قلة الفرص المتوفرة للممارسة الأكلينيكية. ان دور الاشراف له اهمية قصوى في تعلم وتدريب طلاب كلية الطب حيث أوضحت الدراسات أن من أهم مميزات المدرب أو المشرف الفعال هو تقديم التغذية الراجعة الفعالة والمتكررة للطلاب. بالإضافة الى ذلك فان المدرب ينبغي ان يبذل الجهد في تطوير مهارات الطلاب في اجراء البحوث الطبية والتطوير الذاتي بما في ذلك مهارات التفكير.

ان مدى قوة العلاقة بين الطالب والمدرّب تعتبر ربما أهم العوامل التي تحدد فعالية وكفاءة الأشراف وقد تفوق بكثير نوعية وطريقة الأشراف نفسها. كما أن الطلاب يعتبرون احترام المشرف لهم واعطاءهم فرص اكبر للعمل باستقلالية أكبر من الصفات المهمة للمشرف الفعال.

### **محددات التعلم الأكلينيكي الفعال: وجهة نظر الطلاب والمدرّبين في المملكة العربية السعودية (الفصل الثالث)**

بالنسبة للهدف الثاني فقد اجريت دراسة نوعية باستخدام طريقة المقابلات في مجموعات مصغرة. اجريت هذه الدراسة لاستطلاع آراء طلاب كلية الطب والمدرّبين بخصوص صفات ومميزات الخبرات الأكلينيكية التي يرون انها تعزز وتتمى تعلمهم الأكلينيكي. وقد نتج عن هذه الدراسة تحديد خمس جوانب مهمة تؤثر في فعالية التعلم الأكلينيكي من وجهة نظر الطلاب. وهذه الجوانب الخمس هي: ١- جوانب ذات علاقة بالحالات الاكلينيكية، ٢- مدى اصالة التجارب الأكلينيكية و محاكاتها للممارسة الفعلية، ٣-جوانب تنظيمية لعملية تدريب الطلاب، ٤-جوانب ذات علاقة بالاشراف، ٥-جوانب ذات علاقة بمهارات تعلم الطلاب. وقد تم تفصيل كل من هذه الجوانب الرئيسية الى عدة نقاط تفصيلية.

اما بالنسبة لوجهة نظر المدرّبين فقد تم تحديد ثلاثة جوانب فقط وهي: ١- جوانب تنظيمية لعملية تدريب الطلاب، ٢- مدى اصالة التجارب الأكلينيكية و محاكاتها للممارسة الفعلية، ٣- جوانب ذات علاقة بالاشراف.

وقد تم الاستفادة من نتائج المراجعة البحثية والتي اجريت في (الفصل الثاني) والدراسة النوعية التي قدمت في (الفصل الثالث) في عمل مقياس جديد لتقييم فعالية التعلم الأكاديمي لطلاب كلية الطب وهذا هو الهدف الثالث من أهداف هذه الرسالة.

## انشاء ودراسة محتويات وعناصر ومقاييس الصلاحية والثقة لاستبانة تقييم فعالية التعلم الأكاديمي لطلاب كليات الطب (الفصل الرابع).

كان الهدف الثالث من هذه الرسالة هو انشاء مقياس جديد لجودة التعلم الأكاديمي: استبانة تقييم فعالية التعلم الأكاديمي لطلاب كليات الطب. النسخة الاولى من هذا المقياس اشتمل على ٤٠ عنصرا تهدف الى استكشاف خمس مجالات مؤثرة في تعلم الطلاب الأكاديمي (للمزيد راجع الفصل الثالث). هذه المجالات: توفير الحالات الأكاديمية (٦ عناصر)، توفير صفات الأصالة في الفرص التعليمية (٩ عناصر)، الأشراف (٧ عناصر)، تنظيم عمليات لقاء المريض بالطبيب (١١ عنصر)، مدى تحفز الطلاب للتعلم (٧ عناصر). تم تجربة هذا المقياس في ثلاث كليات طب في مدينة الرياض وعلى ١٠٩ طلاب. أوضح تحليل العوامل مصداقية الخمس المجالات السابقة وأسفر هذا التحليل عن ظهور مجال سادس. وكانت نتيجة تحليل العوامل كما يلي: العامل ١: الحالات الأكاديمية (٨ عناصر)، العامل ٢: صفات الأصالة (٨ عناصر)، العامل ٣: الأشراف (٨ عناصر)، العامل ٤: تنظيم لقاء المريض بالطبيب (٤ عناصر)، العامل ٥: التحفز للتعلم (٥ عناصر) و العامل ٦: وعي الطلاب بانفسهم (٤ عناصر). كان الثبات الداخلي للمقياس ( $\alpha$ ): ٠.٨٨. وتراوحت مقاييس الاعتمادية للعناصر الستة من: ٠.٦ الى ٠.٨٨. وتم تأكيد النظريات المسبقة حول ارتباط المصداقية بين هذه العناصر الأمر الذي يثبت صفة الصلاحية المتقاربة لهذه العناصر. كم اتضح وجود فروقات اعتبارية بين جوانب الأشراف وتنظيم لقاء المريض بالطبيب بين الكليات الثلاث المشاركة في الدراسة.

أوضحت هذه الدراسة أن استبانة تقييم فعالية التعلم الأكاديمي لطلاب كليات الطب هو مقياس متعدد الجوانب و ذو مصداقية. حيث يمكن استخدام هذا المقياس لتبصير الطلاب و المدرسين على حد سواء بخصوص جودة وفعالية التعلم الأكاديمي. كما أن المزيد من البحوث ضرورية لأستقصاء بعض الجوانب خاصة فيما يتعلق بالصلاحية المتباينة.



## تقييم طلاب الطب لتجربتهم الأولى لدراسة الأخلاقيات الطبية (الفصل الخامس).

أصبحت مادة أخلاقيات المهنة الطبية أحد أهم مكونات المنهج الطبي لتدريس طلاب كلية الطب. كما أن تدريس هذه المادة الحيوية يجب أن يتكامل ويتناسق مع مواد المنهج الأخرى. وكانت أهداف الدراسة: مراجعة مادة الأخلاقيات الطبية التي تدرس حالياً في كلية الطب بجامعة الملك سعود بن عبد العزيز للعلوم الصحية وكذلك - استطلاع آراء وانطباعات طلاب كلية الطب حول مكونات وجوانب المادة المختلفة. تمت دعوة الطلبة بالمشاركة في هذه الدراسة عند الانتهاء من دراسة مقرر مادة الأخلاقيات الطبية مباشرة وذلك بتعبئة استبانة معدة مسبقاً. وتم تحليل النتائج بطريق نوعية لفحص آراء وانطباعات الطلاب عن الجوانب المتعلقة بالمادة وتدريسها.

بلغ عدد المشاركين في هذه الدراسة واحد وأربعون طالباً. عبر جميع الطلاب المشاركون عن موافقتهم القوية بأهمية المادة وكذلك حاجتهم لدراستها. كما تم استيضاح آرائهم حول تنمية المهارات المهنية، سبل تقييم الكفاءة الأخلاقية ومتى يتم تقييمها؟

أبدى الطلاب المشاركون وجهات نظر قيمة مدعومة بالأبحاث والدراسات المنشورة. كما أوصت الدراسة بضرورة الأخذ في الاعتبار هذه الآراء في مراحل تخطيط وتنفيذ المنهج الطبي.

## ادراك طلاب كلية الطب بمدى انتشار مشكلة تعاطي الكحول والمواد المخدرة بالمملكة العربية السعودية: دراسة مقطعية (الفصل السادس).

فيما يتعلق بالهدف الخامس فقد تم دراسة ادراك طلاب كلية الطب بمدى انتشار مشكلة تعاطي الكحول والمواد المخدرة. أن تعاطي اي قدر من الكحول يعتبر ممارسة غير نظامية لأن انظمة المملكة العربية السعودية والمبنية على الشريعة الإسلامية تمنع تعاطي الكحول أو أي من المواد المخدرة الأخرى. وبالرغم من محدودية

المعلومات المتوفرة عن مدى انتشار هذه المشكلة الأ أن التقارير الصادرة بخصوص تهريب المخدرات ينذر بأهمية وحجم المشكلة.

وقد أوضح معظم الطلاب الذين شاركوا في هذه الدراسة ان مشكلة تعاطي الكحول والمواد المخدرة تعتبر مشكلة شائعة في المجتمع السعودي، حيث اعتقد الطلاب ان الكحول هو أكثر المواد تعاطيا يتبعه الامفاتيمن فالهروين و الحشيش ثم الكوكايين. كما ان الطلاب يرون ان تأثير الصلبة وضغوط الحياه والتدخين والفضول كانت من أهم اسباب التعاطي. كما اتضح من وجهة نظر الطلاب ان تخفيف التوتر من اهم فوائد تعاطي الكحول والمواد المخدرة الأخرى. ومما يثير الأهتمام فأن حوالى ٣٪ من الطلاب أبدوا احتمالية تعاطيهم للكحول والمواد المخدرة الأخرى في المستقبل. ان مما لاشك فيه ان هناك حاجة للمزيد من الجهد لتعليم طلاب كلية الطب ، وفي وقت مبكر، باضرار الكحول والمواد المخدرة واسباب التعاطي وكيفية الوقاية. كما أن هناك حاجة في تعليم وتدريب الطلاب مهارات واستراتيجيات التعامل مع ضغوط الحياة الأمر الذي قد يقلل من احتمالية البدء في تعاطي الكحول والمواد المخدرة.

### معلومات طلاب كلية الطب في المملكة العربية السعودية

#### ومواقفهم وممارستهم لتدخين التبغ (الفصل السابع).

سادس أهداف الرسالة كان دراسة معلومات طلاب كلية الطب في المملكة العربية السعودية ومواقفهم وممارستهم لتدخين التبغ. أن تدخين التبغ له اضرار سلبية جسيمة على الصحة وللممارسين الصحيين لاسيما طلاب كلية الطب الذين هم أطباء المستقبل دور بارز في محاربة التدخين في المجتمع. أوضحت هذه الدراسة أن معلومات الطلاب عن أضرار تدخين التبغ جيدة وبالرغم من هذا فان مايقارب من ٢٥٪ منهم لايزالوا يمارسوا هذه العادة. ان نتائج هذه الدراسة ينبغي أن تؤخذ بعين الاعتبار خاصة من أصحاب القرار في العملية التعليمية كما ينبغي أن يتم الأهتمام بتدريب الطلاب باساليب ومهارات التقليل من الضغوط حيث أوضح الكثير من الطلاب المدخنين أنهم يمارسون التدخين من أجل التخفيف من ضغوط الحياة المختلفة.

## المناقشة والاستنتاجات

لقد تم الاستفادة من النتائج المستخلصة من مراجعة البحوث والأدبيات وكذلك الدراسة النوعية في الفصلين الأول والثاني في تصميم واختبار استبانة تقييم فعالية التعلم الأكاديمي لدى طلاب كلية الطب. وقد أوضحت الدراسة في الفصل الثالث أن هذه الأداة ذات مصداقية وتم اختبار مقاييس صلاحيتها جزئياً ويمكن أن تستخدم من قبل الطلاب والمدرسين لتقييم فعاليات التدريب الأكاديمي. ان تدريس مادة الأخلاقيات الطبية يجب أن يكون بشكل تكاملي مع مواد المنهج الطبي الأخرى. ومن وجهة نظر الطلاب فان تدريس هذه المادة يجب أن يبدأ به بشكل مبكر ثم يعاد تدريسه في سنوات لاحقة مع تركيز أكثر على المشاكل الطبية الأكاديمية ذات الصلة بمبادئ و أخلاقيات المهنة. ان مشكلة تعاطي المخدرات في المجتمع تعتبر ، من وجهة نظر الطلاب، مشكلة شائعة، بل أن ٣٪ من الطلاب اشاروا أنهم قد يتعاطوا الكحول أو مواد مخرة أخرى في المستقبل. كما أوضح ٢٥٪ من الطلاب أنهم يدخنوا التبغ. وحيث أشار الطلاب الى علاقة مشكلات تعاطي الكحول والمواد المخدرة والتدخين بالضغط. خاصة تلك المصاحبة لدراسة الطب، فإنه من الضروري تعليم الطلاب وتدريبهم على السبل المثلى للتعامل والسيطرة على الضغوط. اضافة الى ذلك، فينبغي توفير وعمل دورات ارشادية للطلاب لدعمهم وخاصة في الأوقات الصعبة والأزمات التي قد تمر ببعضهم ولتقليل فرص تعاطيهم للتدخين والكحول والمواد المخدرة الأخرى.

### التوصيات للبحوث المستقبلية

على الرغم أن الدراسة في الفصل الثالث أوضحت أن استبانة تقييم فعالية التعلم الأكلينيكي هي أداة متعددة الأبعاد وذات مصداقية ويمكن استخدامها لتقييم جودة وفعالية التدريب في الدورات الأكلينيكية لطلاب كليات الطب، ألا أن الحاجة مازالت قائمة لتقييم الصلاحية التركيبية لهذا المقياس. حيث يمكن دراسة الصلاحية التركيبية باستخدام مقاييس موضوعية للجوانب المختلفة لاستبانة تقييم فعالية التعلم الأكلينيكي ويمكن من خلالها دراسة الصلاحية وخاصة الصلاحية المتباينة والتي لم يتم دراستها بعد.

كما ايضا ينصح بدراسة امكانية استخدام وتطبيق المقياس الجديد في كليات طب مختلفة داخل وخارج المملكة العربية السعودية.

وينصح كذلك باستخدام وتطبيق طرق ابداعية في تدريس الأخلاقيات الطبية كتلك التي يستخدم فيها حالات اكلينيكية ذات معضلات اخلاقية وذلك لتشويق الطلاب بمواضيع المادة ولتمكينهم من فهم أفضل لها.

وحيث أوضح مايقارب من ٣٪ من الطلاب احتمالية تعاطيهم للكحول والمواد المخدرة الأخرى فان هناك حاجة ماسة لاجراء دراسات عقلية لتحديد مدى استخدام طلاب كليات الطب لهذه المواد لأن تطبيق الاستراتيجيات الفعالة في الوقاية والعلاج من تعاطي الكحول والمواد المخدرة يتطلب معرفة وافية بحجم هذه المشكلة لدى طلاب كلية الطب.



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## Curriculum Vitae

Ali IA AlHaqwi was born in Alhaqu, a small village in a southern province of Saudi Arabia, Jazan, on the 24th of September 1968. At the age of six, he moved with his family to Riyadh, the capital city, where he continued his education. In 1985 he finished secondary school and entered the college of medicine, King Saud University and graduated in 1991.

In 1993 he joined postgraduate fellowship training in Family Medicine. He obtained his higher diploma in Primary health care in 1994, membership of the Royal College of General Practitioner in United Kingdom (MRCGP) in 1995, and membership of the Arab Board of Family Medicine in January 1996.

He joined the Department of Family Medicine at King Abdul-Aziz Medical city, National Guard Health Affairs, on March 1996 as Associate Consultant. From 1998 till present he is working as a consultant at this department of Family Medicine.

In 2005, he joined the newly established College of Medicine, King Saud Ben Abdul-Aziz University for Health Sciences (KSAU-HS), as assistant professor, Department of Family Medicine. KSAU-HS was founded by National Guard Health Affairs. From 2011 till present, he is working as associate professor and consultant, Department of Family Medicine, King Saud University Health Sciences.

Dr. AlHaqwi organized and participated in many teaching courses and activities for undergraduate and postgraduate medical students.

In 2009 he got a Master degree in Medical Education from King Saud Ben Abdul-Aziz University for Health Sciences, Riyadh. After that he started the present PhD studies.

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## **Presentations in international conferences**

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- Oral Presentation: Determinants of Effective clinical learning and teaching. Seventh Asia Pacific Medical Education Conference. (APMEC). National University of Singapore: 6-7 February 2010.
- Poster presentation:— Perception among medical students in Riyadh, Saudi Arabia, regarding alcohol and substance abuse in the community Seventh Asia Pacific Medical Education Conference. (APMEC). National University of Singapore: 6-7 February 2010.
- Oral Presentation: Development and factor structure, reliability and validity of the Clinical Learning Evaluation Questionnaire (CLEQ) for undergraduate clinical education. The second Saudi International Medical Education Conference. Riyadh: 23-25 April 2012.
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