Student evaluation of medical school curriculum transformation in Iraq [version 1]

Huda Noori Jawad¹, Zainab Amir Abd-alnabi¹, Layla Mohammed Abd-alKadir¹, Noor Falah Hassan¹, Zahraa Abbas Mutlaq¹, Krishna Doshi², Michael Kron², Taghreed K Alhaidari¹

¹Al Kindy College of Medicine
²Medical College of Wisconsin

Abstract
This article was migrated. The article was marked as recommended.

Introduction: Decades of political and social unrest negatively impacted medical education in Iraq. Recently, new opportunities arose for medical schools to engage international education organizations and the World Health Organization to implement medical school curriculum changes, replacing older discipline-based, teacher-focused systems with a systems-based, student-focused reformed curriculum.

Methods: A descriptive, cross sectional quantitative study was designed to survey medical students near the beginning (years 2-3) and at near the end (years 5-6) of their six-year program at the Al Kindy College of Medicine, University of Baghdad, Iraq.

Results: A validated questionnaire collected data on thirty-two issues, including student perception of learning, student perception of teachers, academic self-perception and student self-perception. Seven of the thirty-two questions included in this survey resulted in significantly different responses from group 1 (second and third year) vs group 2 (fifth and sixth year) students.

Conclusions: This study concluded that the two student groups were significantly different in their awareness of the need for curriculum change, but that student self-perception in both groups was less than ideal at present. In the future, studies are planned to assess student confidence in their professional development, as teaching institutions advance toward broader accreditation and thus opportunities for their students.
**Keywords**
Medical Education, Iraq, University of Baghdad, Al Kindy College of Medicine, Curriculum evaluation

**Corresponding author:** Michael Kron (mkron@mcw.edu)

**Competing interests:** No competing interests were disclosed.

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Introduction

Decades of social unrest, magnified by the impact of large internally displaced populations within and surrounding Iraq, the unintended consequences of international sanctions and fluctuating oil prices, has severely and negatively impacted medical education in Iraq (Simpson, 2017; Kron et al., 2019). After the fall of the previous regime in 2003, there were tremendous disruptions to Iraqi society, including the destruction of over 20% of the nation’s hospitals and widespread kidnapping or death of more than 2,000 physicians and medical students (Al-Kalisi, 2010; Al-Kalisi, 2013; Amin and Khoshnaw, 2003; Barnett-Vanas et al., 2016; Burnham, Lafa and Doocy, 2009; Jalili, 2007; Tarzi, 2015; Webster, 2009). Unofficial statistics from the Al Kindy College of Medicine (AKCOM), University of Baghdad, indicate that only a small minority of medical graduates have the opportunity to take USMLE step exams because they are not offered in-country and the costs of traveling outside of Iraq for exams is prohibitive. Not surprisingly, the prevalence of post-traumatic stress amongst Iraqi citizens in 2015 was calculated at 11%, particularly affecting women of all ages (Bradley, 2016; Steel, 2009; WHO, 2019).

The first Iraqi medical school was established in 1927 based on a British model, however by 1988 the entire medical education structure had been disrupted by the Iraq-Iran war. In recent years, with leadership from the World Health Organization, the World Federation of Medical Education, and the National Council for Accreditation of Medical Colleges in Iraq, major initiatives have been undertaken to transform the core structure of medical education in all thirty Iraqi medical schools by modifying curriculum content and teaching styles in order to provide students with appropriate learning environments, knowledge and skill sets that will in turn restore excellence and self-confidence as they progress to more independent patient care (WHO, 2016; Yousif, 2007; Hani and Gouda, 2014; Al-Shamsi, 2017).

In 2016, the Iraqi Ministries of Health and Education and AKCOM engaged its administration and curriculum committee to critically review its entire medical school curriculum, and with input from a variety of international accreditation agencies, work to transform a traditional discipline based curriculum and teacher-centric mindset, into a more modern integrated and student centered teaching atmosphere (Quintero et al., 2016; Enns et al., 2016; Cosdly, 2015; Norman and Schmidt, 1992). As in most countries, major transformations in curricula have the potential to at least temporarily, increase anxiety or confusion in the students and faculty, since there is often no other structure with which to gauge the success of new quality improvement measures.

Therefore, to gain information about student perceptions about curriculum change, as well as their general perception of learning, teachers, academic self-perception and social self-perception, a formal survey of these elements was designed, implemented and completed (Richards, 2000; Stromso, 2004). In the future, this data will be critically important to measure and guide the continued transformation of medical education in Iraq. Understanding student perceptions and responses to new academic pressures in a country experiencing special social-cultural challenges including the displacement of millions of culturally distinct populations, is considered key to appropriate redesign and modification of new integrated curricula that will in turn lead to broader accreditation opportunities for institutions and students (Al-Hemiary et al., 2017; Al-Hilfy, 2015; Lafta et al., 2018).

Methods

A cross sectional descriptive quantitative study was carried out among students in the 2nd through 6th year of the six-year curriculum of the Al Kindy College of Medicine. Data was collected between December 10, 2016 and May 18, 2017. Responses were collected from 294 students, 159 in group 1 (second and third year students) and 135 in group 2 (fifth and sixth year students). The 32-question survey was self-administered and included two questions about student awareness of the type of curriculum being taught and an additional thirty questions about student perceptions of learning, teachers, academic self-perception, perception of atmosphere and social self-perception (Seneviratne, 2015). A cross sectional descriptive quantitative study was carried out among students in the 2nd through 6th year of the six-year curriculum of the Al Kindy College of Medicine. Data was collected between December 10, 2016 and May 18, 2017. Responses were collected from 294 students, 159 in group 1 (second and third year students) and 135 in group 2 (fifth and sixth year students). The 32-question survey was self-administered and included two questions about student awareness of the type of curriculum being taught and an additional thirty questions about student perceptions of learning, teachers, academic self-perception, perception of atmosphere and social self-perception (Seneviratne, 2015). This survey was approved by the research ethics committee of the AKCOM.

Collected data were organized, tabulated and analyzed using Statistical Package for Social Sciences (SPSS) for windows, version 17.0, IBM, USA. Descriptive statistics of variable were presented as frequencies and percentages for categorical variables. Comparisons between student groups 1 and 2 were tested by student’s test (Chi Square) for all continuous variables according to categorical variables (stage). P values were calculated as levels of significance and values <0.05 were considered significant.

Results/Analysis

Seven of the thirty-two questions included in this survey resulted in significantly different responses from group 1 (second and third year) vs group 2 (fifth and sixth year) students [Table 1]. Fifth- and sixth-year students (group 2) were more aware in general of the types of curriculum in medical school (traditional vs integrated) than second and third year students (group 1). However, the groups were equally aware or unaware of the type of curriculum they were then experiencing. On the topic of student perception of learning, 48.4% of group 1 agreed that teaching is student-centered
Table 1. Survey administered to 294 students at the Al Kindy College of Medicine, University of Baghdad, Iraq.

| Questions                                                                 | Responses          | P value |
|---------------------------------------------------------------------------|--------------------|---------|
| 1. How many types of curriculum are in our college?                       | Don’t know, One, Two, Three |         |
|                                                                           | 25.8%, 5.0%, 64.3%, 4.8% | 0.03*   |
| 2. What type of curriculum are you engaged with?                          | Traditional, Integrated, Neither, Both |         |
|                                                                           | 44.1%, 46.3%, 4.8%, 4.8% | 0.00    |
| Student perception of learning                                           |                    |         |
| 3. The teaching is student-centered                                       | Agree, Somewhat agree, Disagree |         |
|                                                                           | 42.2%, 39.8%, 18% | 0.011*  |
| 4. The teaching is well focused                                          |                    |         |
|                                                                           | 17.7%, 57.8%, 24.5% | 0.131   |
| 5. The teaching helps to develop my self-confidence                       |                    |         |
|                                                                           | 27.9%, 41.1%, 31% | 0.036*  |
| 6. I am clear about the learning objectives of modules and lectures       |                    |         |
|                                                                           | 25.9%, 53.0%, 21.1% | 0.089   |
| 7. The teaching is too teacher-centered                                    |                    |         |
|                                                                           | 22.4%, 42.5%, 35.1% | 0.047*  |
| 8. Technology is used to deliver information in the classroom             |                    |         |
|                                                                           | 38.1%, 42.5%, 19.4% | 0.130   |
| 9. Crowded classrooms hamper the use of teaching methods                  |                    |         |
|                                                                           | 48.0%, 27.9%, 24.1% | 0.095   |
| 10. Students are actively involved in planning learning and choices       |                    |         |
|                                                                           | 23.1%, 40.8%, 36.1% | 0.811   |
| Student perceptions of teachers                                          |                    |         |
| 11. Teachers are knowledgeable                                           |                    |         |
|                                                                           | 46.3%, 46.6%, 7.1% | 0.044*  |
| 12. Teachers have good communication skills                               |                    |         |
|                                                                           | 18.4%, 58.5%, 23.1% | 0.132   |
| 13. Teachers give clear examples                                         |                    |         |
|                                                                           | 28.6%, 53.7%, 17.7% | 0.081   |
| 14. Teachers are well prepared for class                                  |                    |         |
|                                                                           | 26.8%, 54.8%, 18.4% | 0.242   |
| Student academic self-perception                                          |                    |         |
| 15. I am confident that I will pass this year                            |                    |         |
|                                                                           | 53.7%, 38.1%, 8.2% | 0.403   |
| 16. I feel I am being well prepared for my profession                    |                    |         |
|                                                                           | 26.2%, 48.6%, 25.2% | 0.088   |
| 17. I can memorize all that I need to                                    |                    |         |
|                                                                           | 11.2%, 51.0%, 37.8% | 0.631   |
| 18. My problem-solving skills are being well developed                   |                    |         |
|                                                                           | 18.7%, 53.4%, 27.9% | 0.046*  |
| Student perception of atmosphere                                          |                    |         |
| 19. Atmosphere is relaxed during labs                                    |                    |         |
|                                                                           | 28.9%, 42.9%, 28.2% | 0.426   |
| 20. Atmosphere is relaxed during lectures                                |                    |         |
|                                                                           | 26.2%, 49.3%, 24.4% | 0.270   |
| 21. Atmosphere is relaxed during seminars/tutorials                       |                    |         |
|                                                                           | 31%, 40.1%, 28.9% | 0.356   |
| 22. Cheating is a problem in this school                                 |                    |         |
|                                                                           | 33.0%, 29.6%, 37.4% | 0.964   |
| 23. I can ask questions when I need to                                   |                    |         |
|                                                                           | 31.6%, 41.2%, 27.2% | 0.250   |
| Student social self-perception                                           |                    |         |
| 24. There is a good support system for students who get stressed         |                    |         |
|                                                                           | 17.3%, 29.3%, 53.4% | 0.820   |
| 25. I am too tired to enjoy lectures                                     |                    |         |
|                                                                           | 50.3%, 36.1%, 13.6% | 0.431   |
| 26. My curriculum enhances patient management skills                    |                    |         |
|                                                                           | 69.7%, 30.3% | 0.135   |
compared to only 34.8% of group 2. 68% of all students agreed or somewhat agreed that teaching was too teacher-centered. 92.4% of group 1 students seemed agreeable that teachers were knowledgeable about their assigned subjects compared to 92.9% of group 2, and a minority in each group had the opinion that teachers were not knowledgeable. Group 1 and group 2 students differed on whether their problem-solving skills were being well-developed but group 1 more than group 2 believed that the new curriculum was enhancing their communication and research skills. Group 2 students were more bothered from classroom crowdedness but also were more positive than group 1 in terms of academic self-perception. The overall picture of social-self-perception was less than ideal, with 53.4% of all students (group 1 plus group 2) having an unfavorable view of existing support systems, specifically those for students feeling stressed by any combination of academic or external pressures.

**Discussion**

This survey represents findings from the first medical student evaluation of a major curriculum change in more than a decade at the Al Kindy College of Medicine. As part of new student orientation, discussions and documents regarding curriculum structure is presented. However, when new curriculum was being implemented, there was concern that students in their 5th and sixth years of medical school might be confused or upset by the major changes. Ideally, measures of the success of the new curriculum would involve comparison of variations in knowledge between Iraqi schools that have or have not implemented new teaching methods. At present, there is no internal country wide examination that is administered to students at all 30 Iraqi medical schools.

Correlation between perception of the learning environment and performance (academic success) needs to be studied. In the spirit of new teaching methodology, continuous formative evaluation of the curriculum is required through teacher and student feedback to identify and solve problems to foster a more inclusive and cooperative learning environment. During the transition from discipline based- to integrated curriculum, there still may be too much of a dependence on formal lectures that do not fully shift the balance toward student-driven learning (more beneficial in the long term.) From the faculty perspective, such a major transition to integrated or problem based learning will still require ongoing encouragement and non-threatening positive feedback that is aimed at further improving the student-teacher relationship.

Integration of curriculum with early clinical exposures is intended to reduce the number of information “silos” and should help to avoid redundancy that leads to information overload. From the student perspective, the broadly beneficial effects of integrated learning should be all the following: improved motivation and satisfaction, professional socialization, enhanced self-reflection and self-appraisal, reinforced learning, better preparation for life-long learning, heightened relevance of new materials, facilitated curriculum updates and review and better clinical reflections on basic science principles. Changes in Iraqi curricula are intended to highlight and reinforce the American Association of Medical Colleges goals for medical education, as well as the World Health Organizations concept of the “five-star doctor for the twenty-first century: a physician should be a care provider, decision maker, communicator, manager and leader, community minded and cognizant of relevant up-to-date research (Boelen, 1994; Cooke, 2006).

Given the history of societal upheaval in Iraq, “academic self-concept” and social-self-concept are sometimes difficult to separate, yet they lie at the heart of long term efforts to maintain self confidence in a medical education system that no longer will allow itself to fall behind the times. Academic self-concept is the perception that a student has about his/her own academic abilities, and is one of the most important variables in the academic world, because of its influence on learning. Social self-perception is defined as the individual’s belief about himself or herself, including the person’s

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**Table 1. Continued**

| Student perception of learning | Agree | Somewhat agree | Disagree |
|-------------------------------|-------|----------------|----------|
| 27. My curriculum enhances communication skills | 75.5% | 24.5% | 0.031* |
| 28. My curriculum enhances research skills | 74.5% | 25.5% | 0.042* |
| 29. My curriculum enhances ability to work in health teams | 67.0% | 33.0% | 0.267 |
| 30. My curriculum enhances independent learning skills | 68.0% | 32.0% | 0.000 |
| 31. The curriculum is more time consuming | 62.0% | 38.0% | 0.617 |
| 32. The curriculum is more stressful | 71.1% | 28.9% | 0.994 |

P values refer to differences between the two student groups surveyed. Group 1: 159 2nd and 3rd year students. Group 2: 135 5th and 6th year students. Asterisks (*) indicate statistically significant differences between the two groups. Percentages indicate the total responses of group 1 plus group 2.
attributes. Encouraging movement toward these goals is exemplified by forward thinking and optimistic AKCOM student’s enthusiastic endorsement of the Universal Declaration of Human Rights (SCORP, 2016).

Conclusion
This study concluded that the two student groups were significantly different in their responses to seven of the thirty-two survey questions. They differed in their awareness of the need for curriculum change, and student self-perception in both groups was less than ideal at present. Group one and group two students were significantly different in their understanding of curriculum design, learning self-perceptions, teaching structure and knowledge in teacher effectiveness. In the future, studies are planned to assess student confidence in their professional development, as teaching institutions advance toward broader accreditation and thus opportunities for their students.

Take Home Messages
- Medical students in Iraq face complex academic and socio-cultural challenges, some of which are the result of immense societal upheaval over the past several decades.
- Recent transformative changes in medical school curriculum and teaching styles pose a new challenge to students contemplating medical school as well as for those already studying within the established six-year medical structure.
- The reasons for sweeping curriculum changes being implemented by Iraqi schools are not uniformly understood by current students.
- There is cautious optimism that new approaches will lead to improved student and teacher performance, and greater opportunities for school accreditation.

Notes On Contributors
Huda Noori Jawad is a medical student in good standing presently enrolled at the Al Kindy College of Medicine, University of Baghdad who participated in this survey as part of a student led project. All students equally participated in the design, collection and interpretation of data.

Zainab Amir Abd-alnabi is a medical student in good standing presently enrolled at the Al Kindy College of Medicine, University of Baghdad who participated in this survey as part of a student led project. All students equally participated in the design, collection and interpretation of data.

Layla Mohammed Abd-alKadir is a medical student in good standing presently enrolled at the Al Kindy College of Medicine, University of Baghdad who participated in this survey as part of a student led project. All students equally participated in the design, collection and interpretation of data.

Noor Falah Hassan is a medical student in good standing presently enrolled at the Al Kindy College of Medicine, University of Baghdad who participated in this survey as part of a student led project. All students equally participated in the design, collection and interpretation of data.

Zahraa Abbas Mutlaq is a medical student in good standing presently enrolled at the Al Kindy College of Medicine, University of Baghdad who who participated in this survey as part of a student led project. All students equally participated in the design, collection and interpretation of data.

Krishna Doshi is a third year medical student at the Medical College of Wisconsin who focused on medical education in Iraq for her Global Health Pathway concentration area. Her contributions included data organization and manuscript formatting issues.

Taghreed Alhaidari is professor of Obstetrics and Gynecology at the Al Kindy College of Medicine, University of Baghdad. She is the faculty supervisor of all students for this project. In addition, she contributed in terms of study design, statistical analysis and data interpretation. ORCID iD: https://orcid.org/0000-0001-8494-8760

Michael A. Kron is a professor of Medicine, Medical College of Wisconsin, Milwaukee, Wisconsin USA. He is a medical education collaborator who played a key role in assisting Al Kindy College of Medicine leadership in its curriculum reform process. In addition, he assisted with formatting, data analysis and writing of this manuscript. ORCID iD: https://orcid.org/0000-0002-8240-5209
Declarations
The author has declared that there are no conflicts of interest.

Ethics Statement
The institutional research committee of the Al Kindy College of Medicine, University of Baghdad reviewed and approved this curriculum evaluation study on 11 August 2016, document reference number 142.

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Open Peer Review

Migrated Content

Version 1

Reviewer Report 30 March 2020

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Deb Halder

This review has been migrated. The reviewer awarded 5 stars out of 5

The strongest parts of the Paper: The use of cross-sectional study has tended to validate the study as universal trait for the Iraq medical school scenario. The descriptive analysis has fostered the results more readable and the comparative study between two guided groups of students has made the presented data adaptable and adoptable. The abstract can present the paper in a nut shell, introduction has been able to draw the point of existing problem dealt in the paper, the rationale of the study along with suitable references. The references are up to date.

The issues of Concern

There are some critical issues of this paper that needs to be addressed. First of all, the sampling procedure does not make any clarity and why this 294 respondents were chosen and whether they were approached ethically cannot be understood. On the page. 45, there is the insertion of formative and summative assessment. But these two terms have not been inserted and clarified at the expositional part of the paper. More reviews on literature are required to defend these sorts of terms and tools. The in-text citation of Bolen, 1994 and Cooke, 2006 with the indication of American Association of Medical College goals cannot be realized with the former conception in the paragraph. It has made disjointed divisions in this paragraph (p.45). The definition of ‘Academic self – concept and Social self – concept’ in the discussion part has not been provided with references which fails to claim reliability of these definitions. The ‘discussion’ aims at analyzing the result critically and what the result really predicts. But this paper has amalgamated discussion with recommendation which is a violation of construction of an academic paper as this sort of amalgamation loses the beauty of stylistics. At p.45, the directive as ‘continuous formative evaluation of curriculum is required through teacher and student feedback’ is similar to recommendation which has been added in the discussion part of the paper. The paper could have added recommendation. Again, this reference has not been cited properly “Jawad H, Abd-alnabi Z, Abd-alKadir L, Hassan N, Mutlaq Z, Doshi K, Kron M, Alhaidari T. MedEdPublish https://doi.org/10.15694/mep.2020.000052.1” as it misses year of publication.
**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 29 March 2020

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faris khazaal
University of baghdad

This review has been migrated. The reviewer awarded 4 stars out of 5

In each type of undergraduate medical learning curriculum, there is cons and pros, the most important is how to apply so that we can reach the goals. I think there is always a need to show the students and to test the aims of the education curriculum. What is ever the results of this study it should explain the differences between the answers between juniors and seniors students and to have recommendations to overcome gaps in learning process.

**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 28 March 2020

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P Ravi Shankar
American International Medical University

This review has been migrated. The reviewer awarded 4 stars out of 5

This is an interesting manuscript about student perception regarding changes in the medical curriculum in a medical school in Iraq. Student evaluation of the curriculum has been presented. Many authors of the paper are medical students. The study has been well written and presented. Many parameters measured in the present study seem to have similarities with those in the Dundee Ready Education Environment Measure (DREEM). The overall classification scheme also seems to have similarities. I would be interested in knowing how the questionnaire was developed by the authors. How was it validated? In which language was it administered? What was the overall response rate? I am also interested in knowing
greater details about the curricular modifications carried out in Iraq. From the paper I understand it is being implemented at all medical schools in the country. The international collaboration between students and faculty is another strength of the paper. The paper would be of interest to a broad group of medical educators.

**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 28 March 2020

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**Trudie Roberts**
Leeds Institute of Medical Education

This review has been migrated. The reviewer awarded 3 stars out of 5

Firstly my congratulations to colleagues in Iraq for writing up and sharing their study. Given the issues and challenges that Iraq has come through their commitment is humbling. As others have commented it would have been good to see a copy of the questionnaire appended to this submission so we could have viewed the questions, together with some information about the types of students enrolled. For example are they direct entry from school, are they all single gender, are they still likely to be living at home with parents and a little more about the medical school culture. I am intrigued to know more about your plans to address the issues you have identified and how plan to continue to monitor student development afterwards.

**Competing Interests:** No conflicts of interest were disclosed.

Reviewer Report 27 March 2020

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**Judy McKimm**
Swansea University
This review has been migrated. The reviewer awarded 3 stars out of 5

Dear all many thanks for submitting this article. I was really interested to hear about the former and current situation in Iraq, and I think many people would be keen to hear how you have been addressing such immense challenges. I think that this could benefit from some strengthening in a couple of areas. First, it needs to clearer how the questionnaire was designed and what you were really trying to find out, i.e. what was the intended outcome from this (not in terms of what you would find out, but more what you would then do with it)? Secondly, I would like the discussion/conclusions to be stronger, again about the ‘so what?’ elements. What specifically will you do with what you have found, why do the differences matter? what will you put in place to address the issues etc?I hope that is helpful, well done for doing this in the midst of all your struggles.

Competing Interests: No conflicts of interest were disclosed.