A Survey of Medical Students' Perceptions of the Quality of their Medical Education upon Graduation

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Abstract

Introduction: To evaluate the perceptions of the graduates of our medical school regarding the quality of their educational programme. Materials and Methods: A total of 183 questionnaires, each containing 262 questions, were completed anonymously by medical students upon their graduation from the medical school. Results: About 77% of the respondents felt that Basic Science courses lacked clinical relevance. Many of the students (61.2%) believed that physiology, amongst other Basic Science courses, was the most clinically relevant course. Assessment of the students about their clinical clerkship and internship rotations was not very favourable. Overall only 28.4% of the respondents were generally satisfied with the medical training they received. Respondents indicated many deficiencies in the curriculum, and in their competences. Exposure to numerous activities was rated by respondents as being inadequate: "geriatrics and gerontology education" (87.5%), "office management" (86.4%), "alternative medicine" (85.8%), "healthcare quality improvement" (85.7%), and "rehabilitation" (83%). Around 70% of the respondents reported that they have not been taught sufficient clinical skills in preparations for $their \,future\,clinical\,practice.\,Only\,33.3\%\,of\,the\,respondents\,felt\,that\,they\,had\,acquired\,adequate$ knowledge and skills to start residency training. Conclusions: This study illuminates many aspects of the curriculum the faculty needs to address in order to prepare physicians effectively and efficiently for clinical work. It can be used as a tool to find the trends in our curriculum and the impact of curriculum revision activities which are currently underway in our School of Medicine.

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Key words: Educational programme, Evaluate, Graduation, Medical school

Introduction

Founded in 1934, Tehran University of Medical Sciences-School of Medicine (TUMS-SoM) is the oldest modern medical school in Iran. It has the most number of academic staff and research productivity in the country, as well as the highest number of both undergraduate and postgraduate students enrolment per year. Each year, 150 to 200 students enter its well-known Medical Doctor (MD) Programme. This programme is the first phase of a continuum of medical education in the country. Students from high school gain direct entry after passing a highly competitive National Entrance Examination and the graduates have license to practise as General Practitioner (GP) all over the country.

The current curriculum of MD programme in TUMS-SoM, like most other medical schools in the country, is a 7-year traditional flexnerian, discipline-based curriculum. It consists of 2 years of mainly lecture-based basic science courses, a 1-year preclinical course, 2.5 years of clinical education, consisting of clerkship clinical rotations of various lengths, and 1.5 years of internship. The content and instructional methods are in accordance with the Ministry of Health and Medical Education (MoHME) "Core MD Curriculum".

There are major challenges facing our MD programmes, among them are the presence of a large number of postgraduate medical residents, the importance of research productivity in the university mission, and academic staff evaluation and reward system. These challenges have led to serious concerns about the quality of the MD programme in preparing our medical students to be able to cope with the demanding task of practice of medicine.

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In early 2007, the first set of national standards for MD programme were published for the first time by the MoHME and all medical schools have been asked to concentrate more on their MD programmes and their students' competencies to practise as a general practitioner and to conduct a self-study according to these standards. One of the most important aspects of these standards is its emphasis on continuous evaluation of MD programme and using its results as a feedback to improve the programme quality. Although it is not mandatory to incorporate the opinions of the students in this process, it is obvious that one of the most important sources of information in any evaluation is the learners' opinions.

Several initiatives have been started in TUMS-SoM to find and overcome the shortcomings of its MD programme. One of these activities is a longitudinal plan to evaluate the quality of MD programme by enquiring from students upon graduation. In fact, the graduates are unique in their understanding about the quality of the programme and the programme directors can use their feedback as an invaluable source for improving their programme quality and especially finding the impact of revision activities.1 Using graduates' point of view in the evaluation of undergraduate medical programmes has been documented in several articles.²⁻⁵ Seeking feedback from graduates is a reasonable approach to evaluation of the medical schools' educational programme, and is utilised in other parts of the world. In the United States, Graduate Exit Questionnaire (GEQ) is part of the routine educational process. Data obtained through these surveys are used for many purposes, including quality assurance, finding areas in need of curriculum revision, and also for tracking changes implemented over a longitudinal period.

The purpose of this study was to gather information on the learners' perceptions of our MD programme. This is the first time that a formal, comprehensive graduation survey is conducted in our medical school. We hope that the results of this study will provide useful information about the MD curriculum in TUMS-SoM and, hence, will benefit the administrators in better decision making.

Materials and Methods

A self-administered, 262-item questionnaire regarding the students' perceptions of the educational programme and their competence, as well as the overall satisfaction with their training, were developed. The questionnaire was based largely on the graduation survey distributed in the United States by the Association of American Medical Colleges (AAMC)⁶ and tailored to fit the specifications of our undergraduate programme. We decided to adopt this questionnaire mainly because of its comprehensiveness and the similarities between the system of education it evaluates. The questionnaire was pilot tested prior to administration. The process of its development and the results of the pilot study, however, were not discussed in this article. The questionnaire has previously been shown to be valid and reliable and the results presented at a national congress on medical education. It contained 262 items consisting of Likert-scale-type questions measuring students' perceptions and satisfaction, as well as demographic questions. For the data analysis, ratings of "agree" and "strongly agree" were combined, as were ratings of "disagree" and "strongly disagree". "Partially agree" was omitted.

Participants were requested to evaluate the quality of different components of their education experience in different phases of medical school; namely, Basic Science course, Pre-clinical course, Clinical clerkship, and Internship. Questions focused on the overall quality of the courses as well as, in the case of Basic Science courses, their clinical relevance. Students were also asked about their perception of the amount of time devoted to different curricular activities. These included 51 activities categorised into 5 domains. Respondents' opinion about the adequacy of each activity was obtained separately using a 5-point Likert-type scale. In this paper, however, the results have been reported for each category and not for each item. Students were asked whether they felt prepared to begin practising medicine as a general practitioner or start residency training. Their overall satisfaction with their training in medical school was assessed using a direct question with a 5-point Likert scale. The last item asked included the time taken to complete the questionnaire.

Between April 2007 and July 2007, questionnaires were distributed to all 183 medical students who were graduating from medical school. Anonymity of the respondents was respected. Each student filled out the questionnaire only once. All questionnaires were handed with a covering letter from the Dean of the School of Medicine, explaining the purpose of the study and requesting the students to participate and give precise responses.

The data obtained through this study were entered into a database and was then used for analysis. Ten per cent of the questionnaires were randomly selected and checked for accuracy of data entry by one of the researchers (AA). Statistical analysis consisted of frequency distributions for each variable. Data analysis was performed using SPSS 14.0 (SPSS Inc., Chicago, IL, USA).

Results

A total of 183 questionnaires were distributed to medical students upon graduation. The process of completing the questionnaire was an indispensable part of their graduation, so all the questionnaires were completed and returned.

Characteristics of the Survey Population

Among the respondents, 55.2% were male and 44.8% were female. The majority of them (81.4%) were between 25 to 27 years old. Almost half of them were single (51.4%) and the rest were married. Of all respondents, 57.9% were studying in their hometown and 41% had moved to Tehran from other towns for studying.

Basic Science Course

Participants rated the degree to which they agreed with 6 sentences concerning their experience during the Basic Science course, and the results are summarised in Figure 1. Only 13.1% of the respondents believed that Basic Science content objectives had been made clear to them. When asked whether integration and coordination of Basic Science contents was sufficient, 67.2% of the participants gave a negative response. Only 42.1% of the respondents stated that the content objectives in this phase matched content of the examinations. Seventy per cent were dissatisfied with the organisation of the content; and only 23% believed that the content taught in this phase prepared them for clinical clerkship.

When asked to give their opinion about the relevance of the specific Basic Science courses in preparation for clinical work, between 59.4% and 72.5% of the respondents indicated that the following courses - biochemistry, biophysics and genetics - had little if any relevance to their work in the clinical setting. Those ranked highest among Basic Science courses in being preparatory for clinical



Fig. 1. Items evaluating Basic Science courses: respondents' ratings of "agree" and "disagree" (*) for the following statements.

Key to statement number

- 1. Basic Science content objectives and examination content matched closely.
- 2 Basic Science content was sufficiently integrated /coordinated.
- 3 Basic Science content was well organised.
- 4. Basic Science content objectives were made clear to students.
- Basic Science content had sufficient illustrations of clinical relevance. 5.
- Basic Science content provided relevant preparation for clerkships. 6.

Note: * Ratings of "agree" are "agree" and "strongly agree" combined, and ratings of "disagree" are "disagree" and "strongly disagree" combined. "Partially agree" omitted.

experience were physiology, general pathology and anatomy (61.2%, 47%, and 44.3% respectively) (Fig. 2).

Preclinical Course

Preclinical course was assessed using a 5-point Likert type scale where participants were asked to rate the quality of each specific course. Most respondents rated gastroenterology and endocrinology courses as either "good" or "very good" (70.5% and 68.3%, respectively). The other 8 courses have lower scores. Figure 3 summarises the respondents' evaluation of the quality of individual courses. The pharmacology and systemic pathology courses were considered the lowest quality by respondents; 17.5% and 15.9% respectively.

Clinical Years

Respondents evaluated their overall educational experience during the clinical clerkships years (fourth to sixth years). They were asked to rate the overall quality of each course (either clinical rotations or other courses delivered during this period) on a 5-point Likert-type scale. Sixty-four per cent of respondents were satisfied by their clinical rotation in infectious disease and rated the quality of the course as either "good" or "very good". This was the



Fig. 2. Evaluation of Basic Science courses for preparation for work in the clinical setting: respondents' ratings of "good" or "poor" (*) when asked how well instruction in the following Basic Science courses prepared them for clinical work.

Key to curriculum item

- 1. Physiology
- 2. General Pathology Anatomy 3.
- Medical Terminology 4
- 5. Immunology
- Microbiology 6.
- 7. Embryology
- 8. Histology
- 9 Parasitology
- 10. Psychology
- 11. Nutrition
- Epidemiology 12.
- 13. Genetics
- Information Technology 14. Biochemistry 15.
- 16. Biophysics

Note: * Ratings of "good" are "good" and "very good" combined, and ratings of "poor" are "poor" and "very poor" combined. Ratings of "fair" omitted.

highest percentage among all the courses in this period. Percentage of participants who rated their educational experience in urology, dermatology, psychiatry, otolaryngology, and neurology as either "good" or "very good" was 57.9%, 57.4%, 54.6%, 51.4%, and 50.8% respectively. Courses with the lowest level of perceived quality included toxicology, neurosurgery, and biostatistics. Toxicology course was rated as "fair" or "poor" by 54.6% of respondents and ranked last in quality (Fig. 4).

When asked to evaluate the overall quality of the 10 clinical rotations during their internship, 69.4% of the participants stated that emergency medicine rotation was either "good" or "very good". As shown in Figure 5, most respondents were dissatisfied with their field experience in community medicine and their clinical rotation in obstetrics and gynaecology (43.7% and 36.7% respectively).

Allocation of Time to Specific Activities

Respondents rated the amount of time that was devoted to 51 activities during their training. These activities were categorised into 5 domains: clinical decision making and clinical care, evidence-based medicine, community-oriented medicine, practice of medicine, and other topics related to medicine such as alternative medicine and domestic violence. Figure 6 summarises in decreasing order of inadequacy the percentage of respondents who felt that the time devoted to these domains was inadequate (ratings of "absent" and "inadequate" were combined). Exposure to numerous activities was rated by respondents as being inadequate: "geriatrics and gerontology education" (87.5%), "office management" (86.4%), "alternative medicine"



Fig. 3. Evaluation of the quality of individual preclinical courses: percentage of respondents reporting that the quality of the individual preclinical course was "good" or "poor"*.

Key to curriculum item

- 1. Gastroenterology
- 2. Endocrinology
- Rheumatology
 Nephrology
- Nephrology
 Semiology
- Systemic Pathology
 Pharmacology

Cardiology

Haematology

Pulmonalogy

Note: * Ratings of "good" are "good" and "very good" combined, and ratings of "poor" are "poor" and "very poor" combined. Ratings of "fair" omitted.

7.

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(85.8%), "health care quality improvement" (85.7%), and "rehabilitation" (83%).

Overall Judgment

Only 28.4% of the participants were satisfied with the quality of their medical education in general. In addition, students were asked whether or not, they have achieved the fundamental skills for practising medicine as a general practitioner. Only 27% of the respondents agreed with this statement. They were also asked whether they felt prepared for the residency training. In response, 33.3% of the respondents indicated that they felt ready for residency training.

Time Taken to Complete the Questionnaire

Respondents reported an average time of 37 minutes (range, 20 to 70) spent on completing the questionnaire.

Conclusion

This survey of medical students' perceptions of the undergraduate curriculum in TUMS-SoM has provided the school authorities with important information. It illuminates many aspects of the curriculum which the faculty needs to address in order to improve the undergraduate curriculum and, hence, train more knowledgeable and skilful physicians.

The data obtained in this study should be considered with some degree of caution. The survey has a number of limitations that should be borne in mind. The fact that the respondents were evaluating their Basic Science and Preclinical educational experiences, which they had completed many years previously, may have influenced their ratings.



Fig. 4. Evaluation of clinical clerkship courses: respondents' ratings of "good" and "very good" when asked about the overall quality of each course.

Key to curriculum item:

- 1. Toxicology
- 2. Ophthalmology
- 3. Orthopedics
- 4. Neurosurgery
- 5. Obstetrics and Gynaecology (OB/GYN)
- Neurology
- 7. Statistics
- 8. Computers
- Otolaryngology (ENT)
- Forensic Medicine
- 11. Radiology

- Psychiatry
 Medical Ethics
- 14. Internal Medicine
- 15. Dermatology
- 16. Epidemiology
- 17. Surgery
- 18. Urology
- 19. Community Medicine
- 20. Paediatrics
- 21. Infectious disease

There is, however, a great difference between the results of our study and other similar studies. This discrepancy is much more noticeable in Basic Science phase of the curriculum, where unclarified goals (70.5% in our study vs 7.6% in the AAMC 2006 report), dissatisfaction with integration and coordination (62.7% vs 15.6%), mismatch between content objectives and content of the examinations (36.6% vs 12.8%), and dissatisfaction with organisation (70% vs 14.4%) seem to be major problems. Seventy-seven per cent of respondents in this survey evaluated the Basic Science courses as having little clinical relevance and therefore failing to prepare them for clinical clerkship. This figure is much higher than that reported in other studies on medical graduates.^{6,7} The 2006 AAMC report of all medical schools' graduation survey indicated a figure as low as $19.6\%^{6}$

Anatomy, general pathology and physiology were the 3 curriculum items considered most helpful in preparing students for clinical work. This is similar to the results obtained in the AAMC graduation survey, where these 3 items also ranked highest in this regard (44.3%, 47% and 61.2% in our study vs 83.5%, 82.9% and 82.9% respectively in the 2006 AAMC survey). Biophysics was the least useful item in preparing students for clinical work according to our study. Physics was also ranked very low among Basic Science courses in being preparatory for clinical experience in the AAMC 2006 graduation survey (45.5% reported as not important or slightly important).⁶

Students' evaluation of the different clinical rotations provided us with valuable information that can be used to give feedback to department directors. An alarming fact, however, is the significantly lower rate of satisfaction with clerkships in our school compared to those reported in the AAMC 2006 graduation survey. In addition, respondents identified a significant number of defiencies. Many activities were evaluated as having received inadequate exposure. This survey emphasises the need for faculty to review and





Note: ENT: otolaryngology; OB/GYN: obstetrics and gynaecology

redesign the way in which psychosocial issues are taught. The amount of time that was devoted to teaching the practice of medicine (including office management, medical record-keeping and healthcare systems) was rated by a great majority of respondents as inadequate or absent. This is in accordance with findings of the AAMC 2006 graduation survey.

About a quarter of the graduating medical students indicated that overall they were satisfied with their medical education (28.4% in our study vs 90.2% in 2006 AAMC report),⁶ and an estimated equal number agreed that they have achieved the fundamental skills for practising medicine as a general practitioner. This significant data may indicate that our present curriculum has failed to provide the students with fundamental knowledge and skills for independent clinical practice. Also, the proportion of our graduates who felt ready to enter a residency programme was significantly lower compared to the graduates of the US medical schools (33.3% vs 91.9%).

Based on data obtained from this study and other investigations into the current problems of undergraduate medical education in our medical school, TUMS-SoM has embarked on a process of curriculum revision and renewal.

Based on the results of this study and several other exploratory studies performed as part of an initiative to plan a curricular reform, steps are being taken to discover and prioritise major deficiencies in our curriculum and plan accordingly. Several areas which need great attention have already been recognised based on the data obtained in this study. These include: lack of integration and coordination in basic science courses, dissociation and lack of relevance



Fig. 6. Deficiencies in medical education curriculum: percentage of respondents reporting that the amount of time devoted to different curricular domains was inadequate (*).

Key to curriculum domains

- Clinical decision making and clinical care
 Evidence-based medicine
- Evidence-based medicine
 Community-oriented medicine
- Community-oriented in
 Practice of medicine
- 5. Other topics related to medicine such as alternative medicine, domestic violence, etc.

Note: * Ratings of "absent" and "inadequate" have been combined.

between basic and clinical training, emphasising areas pertinent to the practice of medicine such as office management and healthcare systems.

The information reported in this paper represents only a small proportion of the information collected. In order to monitor and assess the quality of the undergraduate medical education curriculum, steps have been taken to institutionalise this survey and perform it annually. To make it feasible and practical, a web-based survey will replace this paper-based system. Longitudinal collection of data will enable the faculty to recognise curricular weaknesses, document results of corrective measures taken, and validate strengths.

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Appendix 1. Sample page of the questionnaire in Persian

الْفُ: تَا جَه حَدَ بِا جَمَلَاتَ زَيْرَ مُوَافَقَيَدَ؟					
	کہا مہلا	بر التم	نظرى	مغالقم	کنا میلا
	موافقم		ندارم		مخالفم
. اهداف آصوزشی روتیشن در دوره کارورزی			D		
ورژ انس کاملا مشخص بود.					
. اهداف آموزشی و شرح وظایف در ابتدای دوره					
ر انحتیار کارورزان قرار گرفت.					
. عملکرد من بر اساس اهداف آصوزشی مورد					
رزیابی قرار گرفت.					
. در دوره کارورزی اورژانس، قرصت برخورد و			D		
یگیری انواع مختلف بیماران (با شرایط مختلف					
الینی) را داشتم.					
. اعضای هیات علمی در آصوزش دوره کارورژی					
ه میزان کافی مشارکت داشتند.					
. اعضای هیات علمی، بازخورد مناسبی از					
ملکرد من ارائه می کردند.					
. زمان حضور در بخش ها پربار بود.					0
. دستیاران، نقش مؤئری در آموزش دوره					
ارورژی اورژانین داشتند.					
. تأکید اصلی روتیشن بر آضوزش صوارد شایع و					
رپایی دوره بود.					

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ب: از کدام یک از روش های زیر در طی بخش یا پس از آن برای
ارزیابی استفاده می شد؟(می توانید بیش از یک گزینه انتخاب
                                                 کنید.)
                                  🗆 آزمون چند گزینه ای
                                          🗆 آزمون شغاهی
                                🗌 مشاهده توسط هیأت علمی
                                   🗌 آزمون ایستگاهی(OSCE)
                      🗆. مشاهده و ارزیابی توسط دستیاران
                                         🗆 آژمون تشریحی
                                                 🗆 غيره
                                    🗆 ارزیابی انجام نشد.
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9.تا چه حد با جعلات زیر سوافقید؟

	کتا سلا	سو افتم	نظرى	مخالفم	کتا میلا
	مر افتم		ئدارم		مخالفم
ا.رویهم رفته از کیفیت تحصیل پزشکی					
راضی هستم.					
2.آموزش دوره بالینی، دانش آموختگان					
را ہرای طبابت مستقل به عنوان یک					

پزشک عمومی آماده می کند.

Appendix 2. Sample page of the questionnaire translated in English

- IV. Emergency Medicine Internship
- a) Indicate whether you agree or disagree with the statements about your Emergency Medicine rotation during internship:
- (Scale: 1 = Strongly Agree to 5 = Strongly Disagree)

	1	2	3	4	5
Learning objectives of the rotation were clear.					
I was notified of the learning objectives and my duties during the rotation at the beginning of the course.					
My performance was assessed against the learning objectives					
I had the opportunity to see and follow a variety of different patients (with different medical conditions) on this rotation.					
My attending faculty members were adequately involved in teaching during this rotation.					
Faculty members provided me with sufficient feedback on my performance.					
My time during this rotation was productive.					
Residents and fellows had a prominent role in teaching during this rotation.					
Common problems and ambulatoray care were adequately emphasised.					

Which of the following evaluation methods were used as part of final evaluation in this rotation? (More than one item may be correct) □ Multiple Choice Questions (MCQs)

- \Box Oral examination
- \Box Observation by faculty member
- □ Objective Structured Clinical Examination (OSCE)
- Observation and evaluation by resident physicians
- Written essay questions
- Other methods; Please specify:
- No formal evaluation was performed.

b) Indicate whether you agree or disagree with the following statement: (Scale: 1=Strongly Agree to 5=Strongly Disagree)

	1	2	3	4	5
Overall, I am satisfied with the quality of my medical education.					
I feel that my clinical training has prepared me to work independently as a general practitioner.					