

Medical Education in the Islamic Republic of Iran: Three Decades of Success

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Abstract

Medical education has undergone vast reform following the Islamic Revolution in the last three decades, with remarkable qualitative and quantitative progress having been achieved following the establishment of the Ministry of Health and Medical Education in 1985. There have been rises in the number of medical, dentistry and pharmacy schools from 7 to 36, 3 to 15 and 3 to 11, respectively, and in the numbers of student admissions in all programmes of medical sciences from 3630 to 6177 and teaching staff from 1573 to 13108, in the decades mentioned. The numbers of students in clinical subspecialty and PhD degrees have increased from zero to 268 and 350, respectively. The quality of medical education has improved with increasing field and ambulatory care training, with more emphasis on teaching preventive medicine and a significant rise in the research activities. In conclusion, Islamic Republic of Iran has been successful in upgrading medical education and research by the unification of health services and medical education into one ministry.

Key words: *Medical education, Health policy, Medical school, Specialism, Teaching, Iran*

Introduction

Medical education in the Islamic Republic of Iran has undergone a major reform in the last three decades. Revision of medical education began by Cultural Revolution Council according to Imam Khomeini's vision and policy in 1981. After the Islamic Revolution in 1979, the main problem in the health system was lack of work force, and in some region, there was only one doctor for over an 18000 population. The situation was even worse among paramedics, such as technicians, nurses, midwives, etc. There were two systems for health care delivery; the Ministry of Health and university hospitals with no collaboration between medical schools and the Ministry (1). The numbers of Iranian medical graduates were approximately 14000 outside the country and almost 14000 inside.

The division of Medicine of the Cultural Revolution Council meticulously compiled all the information related to both the Ministry and the allied schools of medical education throughout the country; the Committee spent 1 yr reviewing successful programmes of medical educa-

tion and health care delivery systems in the world and conducting discussions with health authorities and faculty members of various medical, dentistry, pharmacy and allied paramedical schools nationwide. Subsequently, the medical group of the Cultural Revolution Council revised the aims and plans of medical education and proposed a unified Ministry of Health and Medical Education (MOHME) (2). The aims were to: 1- Improve the quality of health care delivery, because there was a need for scientific upgrading and research, bringing "new blood" to the old and static Ministry of Health system; 2- Increase the number of admissions in all branches and subdivisions of medicine, dentistry, pharmacy nursing and paramedical services in a manner conducive to training sufficient health personnel, using institutions of the Ministry of Health for education; and 3- To involve and mobilize students in daily health care delivery in rural and urban areas. Above-mentioned aims would only be possible in a unified organization, as many previous attempts for collaboration between the two systems had failed (3).

After the new MOHME was established, the organization developed further and universities of medical sciences were established in all provinces, facilitating increases in the numbers of student admissions. The chancellor of the university in each state is responsible overall for health, medical education, research, preventive and curative medicine in the capital and in all urban and rural regions (4).

The purpose of this paper is to review the qualitative and quantitative development in medical education in the last 30 yr in the Islamic Republic of Iran.

Universities of Medical Sciences

There were seven medical, three dentistry and three pharmacy schools in Iran before the Islamic Revolution (5). In the 1980s, 10 more schools were established. However, the increase in and development of educational institutions reached its peak following the establishment of the Ministry of Health and Medical Education. By the end of 1994, 34 medical, 13 dentistry and 9 pharmacy schools were officially established in medical education (6); these statistics are 36, 15 and 11 in 2008 (Table 1). There have been parallel rises in the number of nutrition, health, nursing, midwifery and other paramedical schools.

Students: A significant growth in the number of admissions occurred in 1985, following the establishment of the new Ministry (6, 7); numbers of female students are between 52% (medicine) and 100% (midwifery) of students in each school. Table 2 shows the rise in student admissions from 1970 to 2008. The rise in number of admissions in medical schools and other institutions of medical sciences is clearly shown in Fig. 1. It is evident that the rise has occurred in mid 80's and 90's and has continued through recent years.

Teaching Faculty

Numbers in the members of teaching staff have increased approximately nine-fold over 30 yr (Table 3). The rapid increase in the number of educational institutions, accompanied by a significant rise in the admission of students, had

resulted in a sudden rise in the student-teacher ratio (6). However, with the rapid development of postgraduate training programmes in the last two decades, and recruitment of new teaching staff, the ratio has declined in the last decade to approximately 8 students per faculty.

Curriculum

Due to vast variations in the curriculum in different schools before Islamic revolution, the Cultural Revolutionary Council planned a standard curriculum for each discipline in 1980, based on the general objectives and health needs of the country (8). More emphasis has been given to preventive and community medicine in theoretical. The curriculum contained two months of field training, the first on entering the clinical medicine stage and, the second, during internship; this required at least 50% of the clinical training hours to be spent in ambulatory care, either in outpatient services of the teaching hospitals or in health centers within the community (9). The Ministry of Health and Medical Education has been working towards reform in medical education for the past decade. Seven years ago, the Education Development Center (EDC) of the Shaheed Beheshti University of Medical Sciences initiated a comprehensive study aimed at developing a new curriculum for medical education. The first batch of students using this integrated curriculum of undergraduate medical education will be graduated from this program in 2010 (10).

Evaluation

The predominant methods of student evaluation have been examinations consisting of multiple-choice questions. However, innovative methods of evaluation such as portfolios, objective structured medical examination (OSCE), Mini-CEX (11) etc. have been employed for student evaluation in recent years. Medical students are obliged to pass two national examinations. After completing courses of basic sciences, students have to pass a national examination before entering clinical courses. Success in the national pre-internship examination is the key to entering the internship program. The MD degree is gained

after completion of 18 months of internship. Evaluation of young members of the teaching staff is performed 3 yr after they enter the faculty. They are awarded tenure of employment upon scoring enough points in education, research and administration. Educational development centers have taken responsibility for teaching technology, developing community-oriented medical education, and evaluation in most universities of medical sciences in the last two decades (12, 13).

Number of Physicians

With development of many institutions for education in medical sciences, there has been a rapid rise in the number of graduates of all schools of medical sciences. Fig. 2 shows that number of registered physicians have increased from less than 20,000 in 1981 to 117, 454 in the year 2008. Sufficient numbers of all medical personnel are in service in every province of the country.

Postgraduate training

Before the Islamic Revolution, although there were some specialty programs in clinical medicine and a few MSc programmes in basic sciences, there were no PhD or subspecialty programmes in this field of medicine.

Since the establishment of the MOHME, there has been a considerable increase of postgraduate programmes; subspecialty courses in clinical medicine were introduced in 1984; with subspecialty training in all fields of internal medicine, pediatrics, and some branches of surgery currently being offered in many universities. The number of PhD programmes has increased in the last two decade (12). Almost 70% of all basic science and paramedical schools offer PhD programmes and all have MSc degree. Fig. 3 demonstrates the rise in the number of student admission in postgraduate courses. The numbers of MSc and PhD admissions have increased from 110 to 1510 and from none to 350 in the last 3 decades, respectively. Concomitantly, there has been increase in annual number of admissions of clinical specialty programs from 401 to 1732 and in clinical

subspecialty programs from zero to 268 from 1975 to 2008, respectively.

Continuing Medical Education

Following an act passed by the parliament of the Islamic Republic of Iran making continuing medical education compulsory; a 5 yr continuing medical education program from 1991-1995 was implemented throughout the country. In 1997, the continuing medical education act was revised, requiring all physicians to undergo courses in continuing medical education, to be able to continue practicing in Iran (1).

Research

There has been a significant rise in the number of papers published by Iranian scientists in health-related journals in last 3 decades (14, 15). Table 4 shows number of biomedical articles published in the Farsi language, from 1979 to 2003. More than half of the total papers have been published in the last 4 yr in that period and the number of papers in each 4 yr period has been increased 30-fold in 20 yr. Similar increases in publications have occurred in the number of scientific papers published in international journals. Fig. 4 shows the number of peer reviewed English papers has increased from 37 to 3176 from 1990 to 2007. In 1992, 60% of scientific papers were published in journals with impact factor of 0-1; however, the trend has been towards publishing papers in journals with higher impact factors in last decade (16); with, 70% of papers being published in journals with impact factor of more than 1 in 2001 (Fig. 5).

Table 1: Number of medical, dentistry and pharmacy schools in the I.R. Iran in last 4 decades

Year	Medicine	Dentistry	Pharmacy
1969	7	3	3
1974	9	4	3
1989	28	7	7
1994	34	14	9
1997	35	15	9
2008	36	15	11

Table 2: Student admissions to programmes of medical sciences in the years 1970-2008, in Iran

Years	Medicine	Dentistry	Pharmacy	Other	All
1970	632	132	172	404	1340
1975	1207	159	179	2880	4425
1980	1287	240	203	3883	5613
1985	2049	311	268	6423	9051
1990	3515	425	796	8949	13685
1994	3630	753	853	13299	18535
2008	6177	850	961	19352	27340

Table 3: Members of teaching staff in educational institutions from 1970 to 2008 in Iran

Years	No. of teaching staff
1970	1573
1975	1981
1980	2908
1985	3575
1990	3987
1994	7979
2008	13108

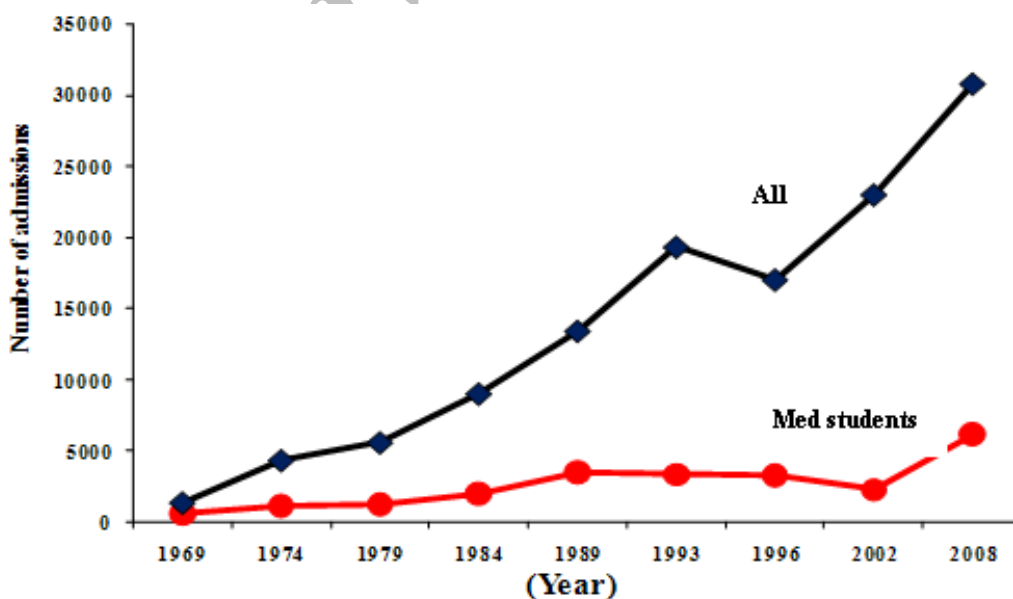


Fig. 1: Number of admissions in medical schools and other schools of medical sciences, 1969-2008

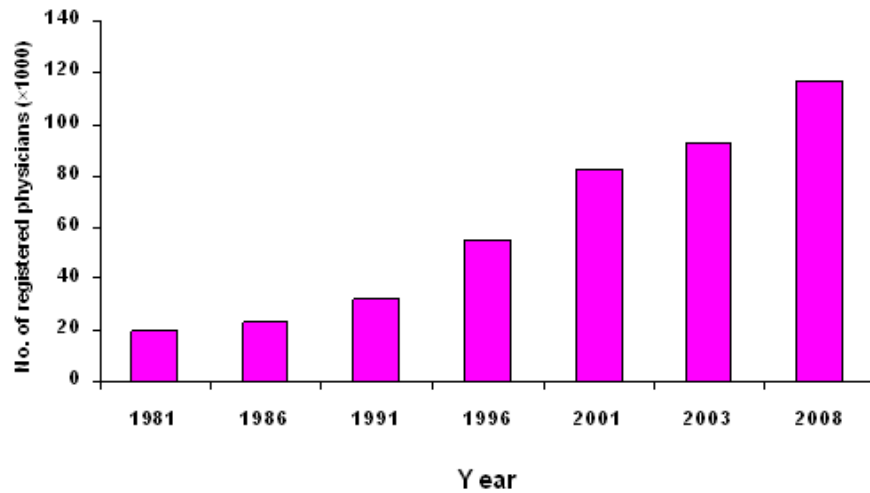


Fig. 2: Physician registration number in I.R. Iran (1981-2008)

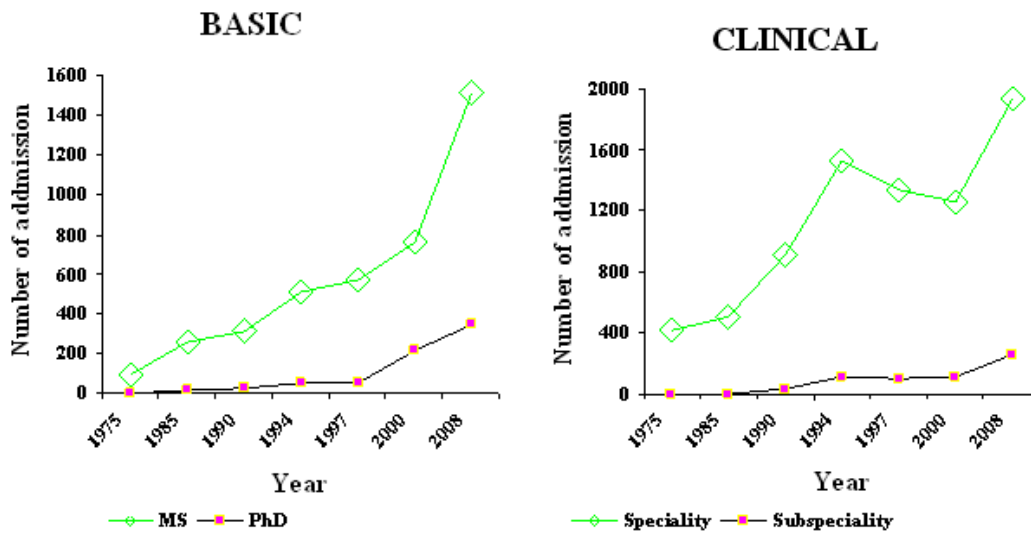


Fig. 3: Number of admissions in postgraduate levels in faculties of medical sciences in Iran 1975-2000

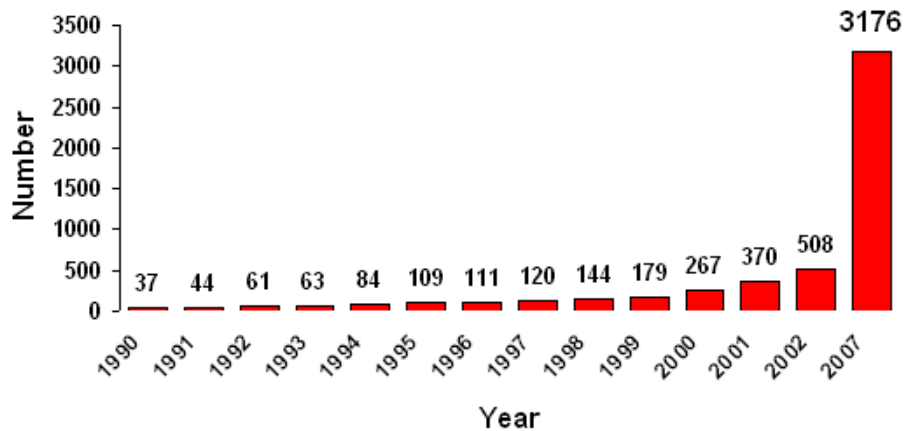


Fig. 4: International publication of Iranian medical scientists: 1990-2002

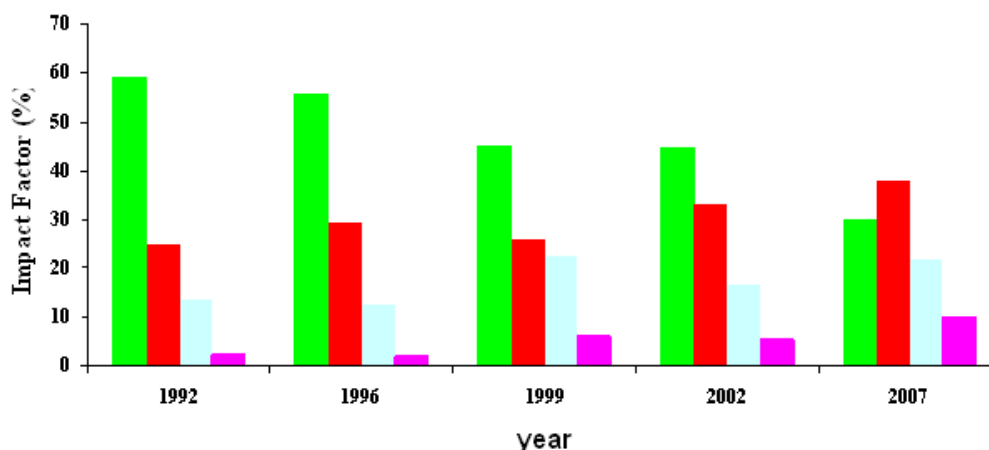


Fig. 5: Impact factor of internationally peer reviewed Iranian medical papers: 1992-2002. Impact factors: 0-1, 1-2, 2-3 and >3.

Discussion

History has repeatedly acknowledged the contributions of Iranian scientists to humankind. The advent of Islam and its teachings underscored the vitality of knowledge to progress and fostered advances in various fields of sciences, during 7-15th century A.D. The progress was made possible by the incentive to learn and achieve, a rich culture, availability of libraries with references of Islamic medicine, the integration of various schools of thought, and development of medicine-related literature and Islamic beliefs motivating physicians and their thirst for knowledge (1).

The establishment of Dar-ul-Fonoon (1849), greatly improved the situation regarding scientific education. Students were also sent to Europe for higher education and with time, modern medicine began to replace traditional medicine. In the first half of the 20th century, with the return of Iranian graduates, much progress was made along modern lines in the development and availability of trained work force and specialized faculties of medicine. Despite all this, there were shortcomings in meeting high international standards both qualitatively and quantitatively (17).

Reforms in medical education in the Islamic Republic Iran have occurred in the past three decades. After the establishment of the Ministry

of Health and Medical Education in 1985, and despite the problems imposed by the Iraq-Iran war, there was a notable rise in the number of medical and other health-related schools, teaching staff, teaching-hospital beds, student admissions, and health workers in Iran in the 80's and 90's. The quality of medical education has improved, through increasing field and ambulatory care training, more emphasis on teaching preventive, rather than curative, medicine, and the development of postgraduate courses (12, 18).

In the 1980s, serious efforts were made to alleviate shortcomings in the lack of skilled manpower, efforts particularly noticeable in the medical faculties. The 1990s witnessed concentrated efforts implemented in enhancing the quality of medical education: using new teaching methods and tools based on student centered problem based learning (PBL), community medical education, along with faculty development, extension of ambulatory care teaching, new methods of evaluation, establishment of education development centers etc. Further development of postgraduate education played a main role in the extension of research in various fields of basic sciences, epidemiology and clinical sciences.

The unprecedented advances of recent years, particularly in the fields of immunology, biochemistry, and genetics, the emphasis on prevention of disease, and the initiation of the "health for

all” approach by WHO and governments have highlighted the need for a fundamental change in approaches to medical education (19). The last four decades revealed that traditional methods of teaching in medical sciences had fallen short of meeting the demands of communities. All this evidence implies the fact that every effort should be made to overcome shortcomings in medical education (20). There is a need for further development of community-oriented medical education, and further improvement of ambulatory care teaching. There is also a need for development of problem-based and student-centered education, integration of basic science and clinical curriculum, and for improvement of evaluation methods in various aspects of medical education (2, 12).

Academic faculty members are the cornerstone of medical education and unfortunately, there is reason to believe that members, both from the basic sciences and the clinical faculties, have a lack of incentive to perform at optimum levels. Socio- economic circumstances make it necessary for the abovementioned to work outside universities, to run private practices limiting the beneficial teaching time afforded to students. The proper implementation of the full time use of their working hours in “full time” contracts must be considered more seriously. Shortcomings in advanced educational and research facilities both in basic science and clinical teaching should be paid attention to. Teaching environments, in particular clinical ones, should also become full-time. Accreditation should be advanced to all medical universities in the country. Limitations in the use of modern updated technology needed in the teaching of basic sciences and in clinical practices are hindering progress to a large extent and widening the gap between the developed and developing countries.

Efforts must be made to enhance working environments and conditions for both the graduating physician and the faculty member. Throughout their time in college, students of medicine view practice of medicine as their ultimate goal. Yet,

despite the innovative methods of teaching being used, they find themselves stepping out into the older conventional framework of clinical practice, not quite in keeping with what they had been made to work so hard for. Ultimately, re-certification should be a main component of continuing medical education. This is now mandatory for most applicants applying to certain organizations in developed countries (21).

Development of research in various aspects of medical education, and implementation of systematic monitoring and evaluation, could help to increase the credibility of this unique model of unification of health services and medical education into one organization (22).

To conclude, it can be said that the I.R. Iran has been successful in its reform of medical education in the last three decades, which has resulted in adequate medical manpower training, qualitative upgrading of postgraduate education and development of health related research and publications.

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