Dental Education and Dentistry System in Iran

Hamid Reza Pakshir

School of Dental Medicine, Shiraz University of Medical Sciences, Shiraz, Iran

Key Words

Dental education · Dentistry system · Iran

Abstract

Before 1979, there were only 5 undergraduate dental schools in Iran with a total admission of 200 students per year, and only 2,000 dentists and about 50 specialists practicing in the country. Currently, there are 18 dental schools with a total admission of 750 undergraduate students, 5 postgraduate programs in 10 disciplines with a total of 100 students, more than 11,000 dentists (1 dentist per 5,500 population) and nearly 1,000 specialists in the country. Two new schools have recently begun offering specialty training courses in 2 disciplines. The length of the dentistry curriculum is 6 years. Students take general and basic science courses during the first 2 years, then continue on the pre-dental and dental courses for the remaining 4 years. The curriculum has been revised over the past 20 years to establish internship and specialty programs and introduce courses reflecting current trends in the dental profession. Dental services in Iran are provided by both public and private sectors. Oral health care was integrated into the Public Health Care network by 1997, and 4 levels of a Dental Health Care Delivery System were established. The first level is concerned with primary prevention at 'health houses', where auxiliary health workers called 'behvarzes' provide periodic examinations, referrals, and oral health education. At the next level, oral hygienists and dentists in 'health centers' per-

form basic oral health care services such as fillings, scaling, and extraction. At the third level, dentists manage and treat oral diseases in 'urban health centers', while the last level is for advanced treatment by specialists in university health centers in the cities.

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Profile of the Country

The Islamic Republic of Iran, with an area of over 1,648,000 km², is a vast region in southwest Asia and ranks 16th in the world in surface area. The country is divided into 28 provinces, 285 districts and over 66,000 villages. Based on the latest census, the population of Iran is estimated to be 60,550,000 with a density of 36.44/km². The percentage of the total population residing in cities is 61.3%, while 38.44% live in rural areas. The annual growth rate in 2000 was 1.47%, with about 46% of the population under 14 years of age, 51.38% under 20, and 4.32% aged 65 years and older. Thus the population of Iran is regarded as one of the youngest in the world (table 1) [1, 2].

National Education System

Article 30 of the Constitution of the Islamic Republic of Iran states, 'The government is duty-bound to prepare free education facilities for all people upon graduation

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Hamid Reza Pakshir
Orthodontic Department, School of Dental Medicine
Shiraz University of Medical Sciences
Shiraz (Iran)
Tel. +98 711 6280456, Fax +98 711 6270325, E-Mail dentdean@sums.ac.ir

from high school. Higher education should be available to all aspirants as the self-sufficiency of the country prescribes' [2].

The educational system of Iran consists of 1 year of preschool (5 years old), 5 years of primary school (6–11 years old), 3 years of guidance school (12–14 years old), 3 years of high school (15–17 years old), and 1 year of pre-university programs (18 years old). To enter dental school, a student must have a secondary education diploma or a preuniversity certificate for higher education as well as a passing grade on the National University Entrance Examination. Of the nearly 500,000 preuniversity students in the experimental sciences who apply for higher education in medical universities each year, only about 700 enter dental schools [1, 2].

Another route to dental schools is available to oral hygienists who are selected from the local communities and trained for 3 years in special dental schools, during which they learn skills such as simple fillings, scaling and extraction. After 6 years of service in local rural communities and after passing the entrance examination at the end of their service, they may continue their education to obtain the degree of Doctor of Dental Surgery [1].

Profile of Dental Schools

As shown in table 2, before 1979 only 5 dental schools in 4 cities (2 in Tehran, and the other 3 in Shiraz, Isfahan and Mashad) offered undergraduate dental education to a total of 200 students each year, and only 2 schools offered postgraduate training in 5 disciplines. Currently there are 18 dental schools in Iran, with an annual total admission of 750 undergraduate and 100 postgraduate students. Four of the undergraduate schools offer training programs for dental assistants, with an annual total admission of 100 students, while 3 schools have training programs for dental technicians with the same number of admissions. In 1975, there were only 250 academic staff members working in 5 dental schools. By 1990, there were 400, and currently there are around 800 academic staff members working in different departments in all the schools (table 3). Approximately 700 new dentists graduate each year [3].

In addition to undergraduate programs, the 5 older dental schools, known as 'mother schools', now offer postgraduate programs in 10 disciplines. Recently, 2 new dental schools have also started postgraduate programs in 2 disciplines. Following the increase in the number of schools and academic staff, the annual number of post-

Table 1. Country profile of the Islamic Republic of Iran

Official name	The Islamic Republic of Iran
Official language	Persian (Farsi), Turkish, other
Land area, km ²	1,648,000
Number of provinces	28
Number of districts	285
Number of villages	over 66,000
Population	60,550,000
Density of population	36.44/km ²
Annual population growth rate, %	1.47
Population under 20 years, %	51.38
Population 65 years and over, %	4.32
Population/physician	2,821
Population/dentist	5,500
Population residing in cities, %	61
Population residing in rural areas, %	39

Table 2. Profile of Iranian dental schools

	1979	2000
Dental schools	5	18
Dental students (undergraduate)	1,000	5,000
Dental students (postgraduate)	20	400
Total admissions/year		
(undergraduate and postgraduate)	200	850
Graduates/year	150	700
Postgraduate programs	2	5–7
Postgraduate disciplines	5	10–11
Academic staff	150	800
Schools for hygienists	3 (1990)	3
Schools for laboratory technicians	2 (1990)	3

Table 3. Number of academic staff members in various departments of Iranian dental schools

Oral and maxillofacial surgery	88
Oral and maxillofacial pathology	27
Oral and maxillofacial radiology	32
Oral medicine and diagnosis	48
Pediatric dentistry	71
Restorative and aesthetic dentistry	96
Periodontics	99
Prosthodontics (removable)	63
Prosthodontics (fixed)	87
Orthodontics	92
Endodontics	90
Total academic staff members in dental schools	793

Table 4. Dental school curriculum in the Islamic Republic of Iran

Stage 1	
Year 1	General courses and a few basic sciences
Year 2	Advanced basic sciences Comprehensive examination
Stage 2	
Year 3	Related medical courses such as Otolaryngology and Internal Medicine, and preclinical technique courses
Year 4	Completion of preclinical courses and start of clinical courses
Years 5 and 6	Pure clinical courses, community-based dentistry
Degrees offered: DMD, DDS.	

graduate students admitted to the programs has increased from 30 to 100 students, and at the present time, around 400 postgraduate students are actively involved in the programs (table 2) [4].

Dental Education Program

The dental curriculum consists of 56 main subjects to be taken over 6 years, or 12 semesters. As shown in table 4, these courses are presented in two stages. In the first stage, which lasts 2 years, students complete a total of 68 credits: 24 credits for general courses and 44 credits for biomedical (basic) sciences. The general courses include: The Islamic Revolution and Its Origin (2), Computers (2), English language (9), Persian Language (3), Family Planning and Population Control (2), Physical Education (2), and History of Islam (4). The basic sciences include: General Pathology (6), Anatomy (6), Immunology (3), Human Histology (3), Biochemistry (5), Embryology (1), Physiology (6), Microbiology (4), Parasitology and Virology (2), Biophysics (2), Public Health (2), Genetics (2) and Psychology (2) [4]. The first stage includes a total of 925 contact hours, of which 568 h are lectures and 357 h are practical training (demonstration and laboratory work). At the end of the first 2 years, students take a comprehensive examination in the basic sciences.

After successfully passing the courses in the first stage and the comprehensive examination, students take the predental (preclinical) and dental (clinical) courses in the second stage, which lasts for the remaining 4 years, or 8 semesters. The preclinical section in the second stage requires a total of 35 credits in the following courses: Oral

and Maxillofacial Pathology (6), Dental Anatomy (4), Internal Medicine (3), Psychiatry (1), Oral Biology (1), Oral and Dental Histology (3), Ear, Nose and Throat (1), Infection Control in Dentistry (1), Dental Emergency (1), Dental Materials (2), Pharmacology (2), Medical and Dental Terminology (4), Methodology in Medical Sciences (2), Nutrition and Oral Health (1), Medical Ethics (1), Medical Law (1) and Dental Instruments and Equipment (1). This part has a total of 680 contact hours, including 476 h for lectures and 204 h for practical training [4].

In the clinical part of the second stage, which is devoted purely to the dental sciences, students take a total of 115 theoretical and practical credits, including 661 h of lectures (approximately 40 credits) and 2,550 h (approximately 75 credits) for practical courses. The courses are: Orthodontics (7), Endodontics (10), Oral Diagnosis (8), Periodontology (7), Removable Partial Prosthodontics (8), Removable Full Denture (9), Fixed Prosthodontics (11), Oral and Maxillofacial Surgery (11), Restorative and Aesthetic Dentistry (9), Pedodontics (8), Oral Radiology (6), Community Dentistry (6), Comprehensive Dental Treatment (7) and the thesis (8) [4].

In summary, students should successfully pass a total of 218 credits in their 6-year training program as follows: (a) general courses, 24 credits; (b) basic sciences, 44 credits; (c) predental courses, 35 credits, and (d) dental courses, 115 credits.

Finally, students submit a thesis to obtain the degree of Doctor of Dental Surgery. But before newly graduated dentists can practice, they must first fulfill certain commitments, such as 2 years of military service or service in deprived areas of the country, after which a license from the concerned ministry can be obtained [2].

The dental curriculum has been revised three times since 1982. The main objective of the first revision was to reduce the dental credits from 220 to 213 by omitting some general courses. In the second revision in 1988, small changes were made in the number of credits, but two major quality changes were also applied: the comprehensive examination was established at the end of the first stage, and an internship program was instituted in the last semester. Finally, the curriculum was changed dramatically in 1999 with the introduction of courses in Community-Based Education, Primary Dental Health Care, Hospital Dental Strategies and Assessment of Medical Emergencies [4]. The postgraduate dental program was also revised in 1999 to update specialty and subspecialty programs such as Maxillofacial Prosthesis, Laser Surgery, Orthognathic Surgery and Implants in Dentistry [3].

Oral and Dental Services

Background

Dental services are provided by both public and private sectors. In cities, where 60% of the population resides, about 80% of dental services are provided by private practices, while in rural areas 70% of oral health services are delivered by the governmental sector [1].

After 1979, the Ministry of Health and Medical Education designed the health system based on the Primary Health Care (PHC) network. The Oral Health Department of the PHC network implemented a pilot project in 1995 and 1996 to integrate oral health care into public domains in 4 districts, and the Dental Health Care Delivery System (DHDS) was established. By 1997, the project had expanded all over the country and embraced the following objectives: (a) promotion of public awareness and improvement of community behavior in oral health, and (b) quantitative and qualitative improvements in delivering oral health care services [1].

Before discussing the levels of oral health care and the DHDS, it is worthwhile giving a brief description of the health network system.

Health Care Delivery System

In 1972, Iran collaborated with the World Health Organisation (WHO) to streamline health care delivery into 4 levels: health houses, health centers, urban centers, and district centers. A health house is the most basic rural facility, covering one or several villages and around 1,500 people. Each health house is staffed by a male and female auxiliary health worker, or 'behvarz', who offer PHC services to the population in the area. 'Behvarzes' are selected from among young and interested residents and are trained for 2 years at 'behvarz' training centers. At the present time, there are nearly 15,000 health houses and 30,000 'behvarzes' in the villages, covering 85% of the rural population [1].

A rural health center is a village-based facility covering 1–5 health houses and approximately 2,500 people. It is staffed by a physician, several health technicians and administrative personnel. An urban health center has the same personnel as a rural health center and provides services to approximately 12,000 people. A district health center is a managerial planning and supervising entity, which supports the preventive and ambulatory health care systems in the district. The district hospital accepts referral cases from both the rural and urban health centers [1].

Table 5. The Dental Health Delivery System (DHDS)

Level	Trained professionals	Treatment
1	'Behvarzes'	Primary Health Care (PHC, primary prevention)
2	Oral hygienists	health and treatment (secondary prevention)
3	Dentists and dental nurses and technicians	management and treatment (tertiary prevention)
4	Specialists	research and evaluation, implants, laser, maxillofacial prosthetics

Dental Health Delivery System

The integration of oral health care into the PHC network was completed by 1997 and aimed to improve community behavior in oral health care. Four levels of the DHDS were established (table 5) [5]. The first level of the DHDS is concerned with primary prevention and designed to remove risk factors. 'Behvarzes' at the health houses are responsible for oral health education, periodic examination of teeth, and referrals to higher levels (rural and urban health centers). They also supervise sodium fluoride mouth rinsing in rural areas. In addition to 'behvarzes', school health workers and oral hygienists are also involved at this level [1, 5].

At the second level, which covers the early diagnosis and primary treatment of simple dental problems, oral hygienists and dentists in health centers supervise the 'behvarzes' in the health houses in their area. They also deliver primary oral health care services such as fillings, pulpotomies, extraction of infected roots, fluoride therapy and scaling [1, 5].

At the third level, or tertiary prevention level, dentists together with dental nurses and technicians are responsible for the management and treatment of dental and oral diseases in urban health centers and clinics. Finally, at the fourth level, advanced treatment is offered by specialists in different disciplines at university health centers in the cities. This specialized treatment will be transferred to district health centers when the required facilities and manpower are available [1, 5].

Oral Health Manpower

The number of dentists in Iran was estimated to be 2,000 before 1979. There are now more than 11,000 (66% men and 34% women), with 1 dentist for every 5,000–

Table 6. Dental and oral health manpower in Iran

	1990	2000
Dentists	3,500	11,000
Population/dentist	15,000	5,500
Male dentists, %	–	66
Female dentists, %	–	34
Employed in public sector, %	–	10
Employed in private practices, %	–	79
Employed in universities, %	–	7.3
Employed in other selected occupations, %	–	3.7
Specialists	100	1,000
Hygienists	200	640
Laboratory technicians	170	570

6,000 citizens, and the number is growing steadily as 700 new dentists graduate each year from dental schools [6]. Only 10% of dentists work in public services, 7.3% at universities and 3.7% in other selected occupations including the armed forces and industries, while the remaining 79% have private practices. Around 1,000 specialists work either in the universities or in private practices. During the past 10 years the number of oral hygienists and laboratory technicians has increased from 200 to around 650

and from 170 to 570, respectively. Finally, more than 30,000 ‘behvarzes’ offer PHC services, including oral health care, to the population in their areas (table 6) [7].

Conclusions

Both dental education and the dental profession in Iran have expanded considerably since 1979. The number of undergraduate schools increased from 5 to 18, and the number of postgraduate programs increased from 2 to 7, with a corresponding increase in enrollment from 200 to 850 students annually (750 undergraduate and 100 postgraduate students). In addition, 3 dental schools now offer programs to train dental nurses, oral hygienists and dental technicians. The dental curriculum has been revised 3 times since 1982 and was recently launched in all dental schools.

The number of dentists has increased from 2,000 in 1979 to more than 11,000 in 2000, while the number of specialists has increased from around 50 practicing in the capital to nearly 1,000 all over the country. Oral health has been integrated into public health domains through the DHDS, which consists of 4 levels, from primary prevention through oral health education in the rural areas at the first level up to special types of treatment by specialists in the cities at the fourth level.

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