



Dental Education: Current Scenario and Future Trends

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ABSTRACT

India has more than 290 dental institutions, producing over 25,000 BDS graduates every year. There are three main characteristics that are shared by any profession: Delivering the best possible education to its students, giving priority to public service over self-interest and enforcing regulations and codes of ethics through self-government. Dentistry in India is currently being challenged to maintain the professionalism. This is partly a result of pressures applied to the educational system. This article discusses some challenges in brief and attempts to attend the challenges in positive manner.

Keywords: Exchange programs, Collaboration, Multimedia, Communication skills.

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INTRODUCTION

The 'offshoring' of the examination glove and dental laboratory industries from the United States to other countries and the rapid growth of 'dental tourism', in which patients travel the world for low-cost dental care, are two examples of the impact of globalization on the profession.¹ To date, dental education does not appear to have fully recognized nor taken advantage of the benefits of globalization. There is a high level of unmet consumer demand for oral health care in countries that are now more prosperous because of the effects of globalization, such as India and China.²

India is a rapidly developing nation of more than one billion people. Public education, for such large numbers of people, has taxed the system tremendously. In order to meet the demand for coveted professional programs, such as dentistry, private dental colleges, have sprung up across the country.

Some people feel that there is lack of standardization and quality assurance measures, such as accreditation.³

It is possible through the globalization of dental education that the difference in quality between academic dental institutions, dental professionals, and dental educators trained in the developing and developed worlds could diminish due to the flattening of the world via technology and trade.⁴

The distribution of dental colleges in India is geographically distorted, with most colleges located in southern and western states like Tamil Nadu, Karnataka and Maharashtra. Colleges need to be opened in under-represented areas like the North East. Doing so would promote more equal opportunities for students, irrespective of where they hail from.⁵

The dental council of India (DCI) is a statutory body constituted by an Act of Parliament through the Dentists Act (1948). Its main objectives are to regulate dental education, the dental profession and dental ethics in the country and to make recommendations to the Government of India regarding applications to start new dental colleges or higher courses and increase the number of seats.⁶ It also maintains educational standards with respect to staff/student ratios, curricula, admission and examination.

In India, there are 294 dental colleges which are listed as offering undergraduate dental courses at the DCI website.⁷ With a large-scale increase in the number of dental colleges over past 10 years, there has been a marked improvement in the dentist-to-population ratio in general terms. There was a similar improvement during the 1980s to 1990s; from 1:80,000 to 1:42,500. At present, the dentist-to-population ratio in India is 1:13,000. However, a significant geographic imbalance among the location of dental colleges in the country results in great variation in the dentist-to-population ratio. The balance is heavily tilted toward the urban areas; the rural areas hardly have any qualified dentists. Young graduates set up their clinics in bigger towns or metropolitan cities. This has led to a mal distribution and overcrowding of dentist in big towns and cities.⁸

Dental Education Models

There have been two philosophical approaches to the practice of dentistry throughout the world: The odontology and stomatology models. The odontology model is prevalent in North and South America, Northern and Western Europe, Japan, India and Australia and is centered on dental education being recognized as an autonomous discipline. In contrast, the stomatology model of dentistry was developed in other parts of Europe and China and views dentistry as a specialty of medicine.

In most dental education systems throughout the world, students begin their dental education upon completion of high school (secondary education), and the dental curriculum typically lasts a minimum of 5 years. In Canada and the United States, students must complete three to four years of pre-dental education at the college or university level as a prerequisite for admission to dental school, which typically follows a 4-year curriculum.⁹⁻¹¹

An ideal approach to reform dental education for all countries is to work together to identify common challenges, share experiences and pool intellectual resources. The comparison between Indian and Japanese dental schools indicates that Indian dentists may need additional education and clinical training in the use of composite materials in posterior teeth. Indian dental students at undergraduate level may need additional education and clinical training in crown.¹² The variation in dental education metrics and practice regulations makes it difficult to develop a set of globally acceptable standards for curriculum structure and outcomes (e.g. competencies to be attained by dental school graduates).

Educators faced with limited time for didactic and clinical coursework and declining resources need to have realistic expectations of what can be achieved in an undergraduate program. Our aim is to be primarily educational and secondarily vocational. Primary goals include the development of a knowledge base for problem solving, the fostering of an inquiring mind, and a critical appreciation of new developments. Secondary goals include knowledge of human behavior, and skills in patient management, assessment, diagnosis and treatment planning. The clinician should be able to manage problems as they arise, cope with new circumstances, and be competent to adapt to future demands. The educators can formulate policies which will approach challenges in a positive manner and provide realistic reasonably sound solutions. Some concepts which if implemented will provide good results are given below.

1. Opening of new dental institutions in rural areas and open up new avenues for practice for young graduates in three tier cities and rural areas.

2. Increase the number of institutions offering post-graduation courses.
3. Increase the ratio of staff to student in each department for a better understanding and guidance of young professionals.
4. Add new subjects in the dental curriculum like dental ethics, forensic dentistry, etc. Dentistry must uphold its professional integrity by not compromising on its social obligations, especially as they relate to professionalism, access and dental education. The profession needs to instill proper ethical values in students, modelled by the institutions themselves.¹³⁻¹⁵
5. Divide courses into two different subjects for better understanding and application.
6. Having more chairs for left handed students in each department and thus making things more user friendly. Left-handed students especially suffered from neck and shoulder pain when compared with right-handed students. It is felt that a modification of work practices appears to be effective in decreasing the prevalence of symptoms.¹⁶
7. *Globalization of dental education:* The recent development of technology has great application and potential in global dental education. The highly technical nature of clinical dentistry and the focus on the technical aspects of laboratory procedures necessitates the learning of skills to impart treatment with strong fundamentals. Modern training cannot continue to lay emphasis on the technical aspects of dentistry that were important 50 years ago. With the development of newer materials and advanced techniques, the learning process has to be dynamic, which has to be catered for in the teaching curricula for the students to stay current with the latest in the world. Student exchange programs, teledentistry and collaboration with foreign universities can be considered under globalization.
 - a. *Student exchange programs with foreign countries:* Different health education practices and work culture could be learnt. These collaborative opportunities provide unprecedented advantages to students, and eventually to the communities where they will serve. The student exchange program initiated by the DCI is one method of supporting these interactions.¹⁷ Our curriculum must include the provision of frequent professional updates and scientific exchange. This has enhanced awareness and implementation of standardized clinical techniques followed the world over. An example of such flattening is Universities of Adelaide and Sharjah to start a new dental college in Sharjah by sharing curricula, intellectual property and as sociated expertise. Using technology to

deliver an online curriculum and various multimedia resources, the University of Adelaide has shown how barriers can be overcome.¹⁸

- b. *Application of teledentistry:* Full use of information technology can be utilised so that rare cases can be discussed and treatment plan made with latest advances. Teledentistry can extend care to underserved patient populations, such as those in rural areas, at a reasonable cost. Teledentistry provides an opportunity to supplement traditional teaching methods in dental education, and will provide new opportunities for dental students and dentists. Teledentistry in education can be divided into two main categories: Self-instruction and interactive videoconferencing. Both of these methods have been used in several studies and countries.¹⁹ An example currently in use in the United States is the company Nighthawk Radiology, which is based in Idaho and operates reading centers in Sydney, Australia and Zurich, Switzerland, allowing radiologists to interpret exams and report the results to attending physicians across time zones.²⁰
 - c. *Collaboration with foreign universities:* Seminars and CDE programs could be accessible through videoconferencing. Through the use of videoconferencing technology, patients and providers in rural locations can link to specialists in distant locations. Digital imaging and intraoral cameras allow the transmittal of clinical information via the internet so that frontline oral health providers can communicate with dentists and specialists in providing optimum care.²¹ These examples illustrate how the practice of dentistry can utilize technology to expand access to oral health care services while at the same time increasing the quality of care provided to patients. This has been suggested already by Indian educationalists.¹⁷
 8. *Introduction of communication skills course:* Future must embrace and empower the significant technical capacities of young students with the 'soft skills' that include communication, team building, and global knowledge that will be required as an essential part of dental education in India. An ability to communicate effectively with patients, in particular, to use active listening skills, to gather and impart information effectively, to handle patient emotion sensitively and to demonstrate empathy, rapport, ethical awareness and professionalism is crucial.²² An interesting finding in the study conducted in a dental school in New Zealand found that large percentage of students found communication skills course more important after finishing the course.²³
 9. *Implementing evidence-based practice in undergraduate teaching clinics:* In developing treatment plan students should demonstrate that their recommendations for the most advanced treatment plans are based on the best available evidence by completing evidence-based dentistry for complex part of treatment options.²⁴ The reviews can be held in clinics as a resource for other students. At the beginning of entry to clinical practice students should be taught how to complete a review by their clinical supervisors. Group of students could meet periodically in patient-based learning, group practice meetings to present newly completed treatment options based on evidence-based dentistry to their peers.²⁵
 10. *Using multimedia in dental education:* A disadvantage of traditional preclinical laboratory teaching is that students have difficulty integrating theoretical knowledge and practical skills resulting in knowledge fragmentation. Literature in education psychology indicates that good interactive multimedia teaching modules may provide intellectual stimulation with immediate feedback for students.²⁶ Multimedia packages of audio, DVD and CD ROM materials all present opportunities to demonstrate art of teaching in action.¹¹
 11. *Simulation:* Modifying teaching techniques and using modern teaching aides like dental simulators to help guide students. Current simulation techniques are not routine part of distance education. An understanding of current methods enhances knowledge of where distance simulation and virtual environments cross path in future. Dentsim and Periosim are such examples.²⁷
- Continuing education, on the other hand, is an ongoing process that allows clinicians to update their theoretical knowledge and practical skills on a foundation of long-term clinical practice. This is a continuous need and we have overcome the difficulty to ensure that a range of courses are offered at the appropriate academic and clinical levels. The avenues for professional accreditation and reciprocal accreditation are on pace with international standards, as India is surely the hub to future dentistry.
- The dentist of the future should be a competent professional with the microsurgical skills necessary for utilizing the ever-changing and improving restorative materials, while also being an accomplished diagnostician and critical thinker. The future oral health care professional must be able to manage the complex medical problems of tomorrow's aging society, as well as children who are developing more serious medical problems at a younger age.

It was very difficult for us to find recent references on dental education in India. This problem with the shortage of recent references was partially resolved by using the collective experiences of the authors. Therefore, it should be noted that any qualitative comments are purely our opinions based on our personal information.

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