International Dental Education

Indian Dental Education in the New Millennium: Challenges and Opportunities


Abstract: India is poised to be a leader in the global economy in this century. Its population of more than 1.1 billion, however, will challenge both the medical and oral health care systems. The current status of dental education in India has some serious challenges that will need to be modified to be able to produce leaders in the field of dentistry to address these burgeoning needs. Dental students in India are trained to excel theoretically, but there seems to be a disconnect between what is learned and what is applied in the clinics. In the real world, when dealing with patients, problem-solving skills and practical knowledge are necessary. Some of the changes that might bring dental education to the next level in India could include selecting highly motivated students for dentistry, modifying the teaching methodology with some importance given to treatment planning, and introducing research into the curriculum. Changing the current attitude of the faculty, students, and the general population towards dental education is another factor important in the successful transformation. The aim of this article is to discuss these issues in preparing the Indian dental workforce for the challenges of India’s growing economy and population.

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This article is based on the personal experiences of the authors and is intended to point out issues we feel that, if addressed, will significantly improve the current standards of dental education in India. All the authors except Dr. Karimbux are currently postdoctoral residents enrolled in dental specialty training programs at the Harvard School of Dental Medicine. All of the authors except Dr. Karimbux received predoctoral dental training in various dental colleges across India between 1994 and 2003 and underwent additional clinical or research training in a U.S. university before enrolling in their program at Harvard. The recommendations made in this article are based on our educational experiences in India and the United States. The issues raised here may not be generalizable to all dental schools in India, but we believe that a significant number of those schools face these challenges.

Dentistry in India

Dental education in India was formally established in 1920s, when the first dental college was started in Calcutta by Dr. Ahmed. Until the 1960s, all dental colleges in India were government-aided colleges. After 1966, private dental colleges were established. Currently, the growth of private dental colleges has far exceeded the number of government-aided colleges. The number of dental schools grew significantly in the past two decades, with a recent report indicating that, of the 185 dental schools in India, a majority are private. The number of graduating dental students was 26,000 in the year 2000, compared to 1,370 in 1960.

One would expect that this burgeoning number of graduating dentists will address the issue of shortage of dentists in India. However, for financial reasons, dentists tend to be concentrated in cities
Admissions Process of Indian Dental Colleges

High school students with a background in physics, chemistry, and biology are eligible to apply to dental colleges. There are two pathways by which a student can gain admission into a dental college: through a government-administered entrance exam or a private school-administered entrance exam. Government entrance exams are of two types: state-administered entrance exams, which are specific for each state (only students who have lived in those states are eligible to apply to dental schools in those states), and common all-India entrance exams, for which all eligible students qualify. Based on their performance in the respective exams, the students are ranked and granted admission by rank order.

The major drawback of this system is that there is only one exam for medical, dental, and paramedical streams including nursing, physical therapy, pharmacy, and occupational therapy. Typically, the order of preference for students is medical colleges followed closely by dental colleges and paramedical colleges. Private institutions administer their own entrance exams, which typically all students irrespective of their in-state status are eligible to take for admission to the individual private dental colleges. In India, the caste reservation plays a significant role in the admissions process. A separate number of positions in the dental colleges are set apart for students belonging to the traditionally socially disadvantaged classes. Debating the need for reservation in dental school admissions is beyond the scope of this article and will not be addressed further here.

One way to deal with the problems that result from one entrance exam for all health professions is by administration of a separate entrance exam for students interested in dentistry irrespective of whether it is a government or private college. Instead of ranking the students, each student should receive a score like in other standardized exams such as the Dental Admission Test (DAT) in the United States. Exams akin to the DAT could serve as reliable indicators of how well a student is prepared to pursue dental education. Studies have documented the association between a standardized exam such as the DAT and performance in dental school.3,4 Having such an exam would provide a fair method of evaluation and also would allow students to focus on one exam rather than preparing for multiple exams in different formats, which is what happens currently in India.

Furthermore, the dental entrance exam should not be linked to the medical admission exam but should be an exam by itself. Having a separate exam will definitely bring students who are really interested in the dental profession to the dental college.

Apart from standardizing the entrance exams, personal interviews would be a valuable addition to the admission process. Personal interaction with the candidates would give admissions committees the opportunity to know them better and to evaluate how passionate the candidates are to pursue dentistry.

Dental Curriculum

Currently, the duration of undergraduate dental training in India is five years, including one year of compulsory internship. The students rotate through various dental specialties after the completion of the formal coursework and examinations given during the first four years of the program.

During the first two years of the program, students enroll in a core curriculum that includes human anatomy, human physiology, biochemistry, pathology, microbiology, pharmacology, and dental anatomy. In the third and fourth years, apart from classes corresponding to courses in the core curriculum that include general medicine, general surgery, and all dental specialties, students also complete rotations in various clinical departments. They will typically spend a fixed period of time at each rotation (usually one month) to hone their clinical skills before moving on to other departments.

At the end of each year of the program, the clinical skills and theoretical knowledge of each student are evaluated through practical patient-based exams, oral exams, and written exams.
Clinical Settings

Students in the clinical years (mostly the third and fourth years) are divided into small groups of eight to ten students and are required to complete rotations in various clinical departments. At the end of their rotations, students are usually proficient in the clinical abilities pertaining to the corresponding department. However, they are poorly prepared to recommend comprehensive treatment planning. For example, a student completing a one-month rotation in restorative dentistry has an opportunity to work only on restorations and has no opportunity to learn how to provide a comprehensive treatment plan for patients. Treatment planning is generally the purview of the supervising clinical instructors.

In most dental schools, students are not trained to treat the patient as a whole. They are expected to learn general patient management skills after graduation. Most of the dental curricula in India lack treatment planning sessions to teach students how to treat plan a case involving all specialties. They are taught to do clinical work for a particular situation, but they are not trained to treat other problems in the same patient. Once a specific treatment is completed, the student no longer sees that patient. This is a sad situation, as dental students need to learn from their treatment successes and failures. Evaluating one's own work longitudinally over a course of time is critical for self-development and becoming better clinicians.

Ideally, when assigned a patient, a student should evaluate the whole mouth and overall health and should come up with both ideal and alternative treatment plans. In India, due to financial constraints, more often than not, patients cannot afford the expensive ideal treatment plan. Consequently, the students end up providing care based on the next best alternative treatment plan. Students should be educated and made aware of various treatment options for a single case. Once the treatment plan is approved by the clinical faculty, the student can phase out the whole treatment plan. After the treatment is completed, the patient can be placed on a maintenance program, wherein he or she can obtain prophylaxis every four to six months along with routine follow-up dental examinations. The importance of follow-up care is underemphasized in most of the dental schools in India. Follow-up care gives an opportunity for the student to longitudinally observe and evaluate his or her own work over a course of time.

Classroom Settings

The theoretical quality of dental courses students take in India is highly comparable to the quality of dental courses in the United States. In India, dental students are required to read textbooks written by leading international authors in a particular field. Apart from textbooks, students read class notes or handouts. Therefore, students learn the same concepts as a student trained in a U.S. dental school. The exams given to students at the end of each academic year are specialty-specific and are designed primarily to test the knowledge base and clinical skills of students in that particular specialty.

In most dental schools in the undergraduate curriculum, there are no dedicated weekly clinical seminars, case presentations, or journal clubs to present treatment planning concepts or to critically evaluate the classic and contemporary literature. Consequently, development of analytical and logical reasoning skills takes a back seat for undergraduate students. The importance of treatment planning seminars has long been recognized in the United States and is well tailored in most current dental education programs. Development of analytical skills and logical reasoning should be given priority by actively engaging students in case discussions and seminars rather than in lectures. Conducting weekly seminars and case presentations will help students to organize their knowledge, learn how to present cases, and benefit from other students' suggestions.

Establishing a problem-based learning (PBL) curriculum in India is extremely important as PBL improves logical thinking and significantly improves student participation and discussion, which is lacking in the current curriculum. Governing bodies such as the Dental Council of India (DCI) should take notice of this learning system and implement it judiciously in dental school settings. PBL creates an environment that is more congenial for learning and improving the knowledge, skills, and attitudes of students. A PBL curriculum creates an academic environment that facilitates acquisition of deeply understood knowledge, develops effective clinical problem-solving abilities, better prepares students for self-directed learning, inculcates team and interpersonal skills, and instills
in students a desire to continually learn. In a PBL educational approach, a case is used by students who work individually or in groups to identify new areas of learning. The goal is not to find the right answers but to inculcate in students a problem-solving approach and to stimulate them to become self-directed lifelong learners. The key learning principle of PBL is self-directed learning.

A typical PBL setting includes six to eight students whose discussion about a case is moderated by a tutor. The moderating sessions are student-centered, and all learning takes place in small groups.

Studies have documented the positive influence of a PBL curriculum in improving standard outcomes such as the national board dental scores, as well as enhancing students’ communication skills and self-assessment abilities. A recent study found that there is an increasing trend in many medical schools throughout the world towards implementing a PBL curriculum. As more and more educational institutions start to implement a problem-based approach to learning, it becomes imperative that dental schools in India also give serious thought to instituting a PBL curriculum.

Faculty Training in India

The dental faculties play a huge role in shaping the future of dental education in India. While most faculty members have completed a master’s program concurrent with residency training in a dental specialty, most of them lack intense research training or a Ph.D. Moreover, most dental schools in India do not have formal tenure-track positions, which typically mandate that faculty members conduct research, publish in peer-reviewed journals, and obtain grants. Consequently, most faculty members in India do not pursue research, nor do they encourage their students to pursue research. Faculty members should be encouraged by the government of India and the Dental Council of India to obtain Ph.D.-level training and should be provided with scholarships to get the training abroad.

Apart from the need for better-qualified educators, there is enormous need for improving the teaching methods of current faculty members in Indian dental colleges. In the United States, faculty members and clinical instructors are evaluated by their students at the end of each course, and these evaluations are taken very seriously. This type of evaluation is definitely important and is missing in the current dental education system in India. Adding an evaluation system will help pave the way for improvements in teaching by the current educators.

Dental Students’ Attitudes

As mentioned above, in India a select group of students enter dental education following nationwide or statewide competitive entrance examinations. Typically, some meritorious students who fail to gain admission into medical schools by a small margin enter dental school, especially in government-aided dental colleges. Students occasionally are forced to join dental schools because their ranking in the entrance examinations was not high enough to secure a spot in medical school or because of financial constraints that preclude them from joining private medical schools, which charge high tuition and fees. This is not a healthy scenario as the students are thus forced to accept a career path that is going to be their profession for the rest of their lives. Administering a separate entrance exam for individuals interested in becoming dentists (like in the United States) is one solution to this problem. A separate exam would allow students who are really interested in dental medicine to attend one of the dental colleges based on their ranking in an exam specific to that profession.

Parental pressure is another factor that plays a role in students’ choice of dentistry as a career. Few students matriculate into a dental school just because of family pressure. As the years pass by, some students develop interest in dentistry and do very well in it while others fade away. The results of a survey conducted in one of the Indian dental colleges found that students who clearly indicated that dentistry was their first choice enjoyed the program and felt less stressful when compared to students whose first choice was not dentistry. The same study also demonstrated that students who joined dentistry due to parental pressure tended to experience more stress during the program than students who joined without any such external pressure.

Working Closely with Residents

In most of the dental colleges in India, there is a huge barrier between undergraduate dental students
and postgraduate residents. Working together with residents would allow dental students to interact and learn from the residents. They would be exposed to many procedures in various specialties and also become familiar with treatment planning cases using a multi-specialty approach, as one does in a private practice. The importance of working in an interdisciplinary fashion along with residents is highly critical in the development of an exhaustive treatment plan that addresses the entire needs of the patient. The importance of interdisciplinary treatment planning cannot be overemphasized: it was recognized in the United States as early as 1972 and is currently followed in most U.S. dental schools.19

Allowing dental students to assist in procedures performed by residents would help the students to observe, which gives them first-hand application of knowledge gained though lectures and textbooks. It would also help them to choose a specialty in the future. At least for half a day per week, the residents should also be required to teach dental students in the clinic, which would be a knowledge-enhancing experience for both the residents and students.

Research in the Dental School Setting

There is very minimal research activity in undergraduate-level dental programs in India. The curriculum is so focused on classes and clinics that the students hardly have time to conduct research. Lack of infrastructure, inadequacy of funds, and lack of research mentors are some of the other reasons for minimal research activity among students in dental schools in India. Almost all the faculty positions in India are teaching positions with very little or no scope for conducting research.

The government of India and the Dental Council of India should recognize the need for dental research institutes and research blocks in each dental college. Going through the process of conducting research will also help students to gain logical reasoning skills that can be directly applied in clinical dentistry. Therefore, a research component should be a requirement in the undergraduate dental curriculum. This would help produce academic leaders with strong research potential and not just teachers in order to make a change in the future of dental education in India. Summer externships are another option, in which students can rotate through premier research laboratories or research institutes during the program.

Conclusions

India with its growing population and economy is challenged by a low dentist-to-population ratio and also the current dental education model. It may not be pragmatic to implement all of the recommendations in this article, but it is time that the Dental Council of India and the government of India revisit the dental accreditation criteria and dental education curriculum and make realistic changes in order to create not just good clinicians but also leaders in the field of dental medicine able to meet the needs of its growing population.

REFERENCES